AW09

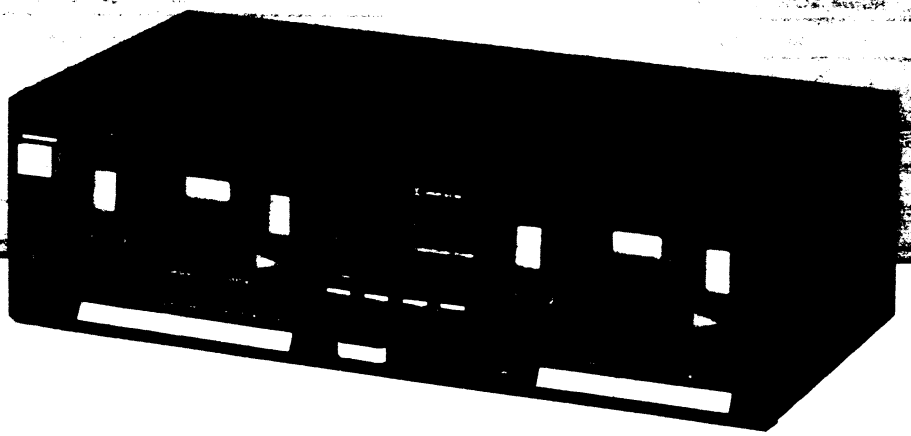
SERVICE MANUAL

# FISHER

# CR-W250F

## Stereo Double Cassette Deck

(EUROPE)



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# SPECIFICATIONS

| CASSETTE DECK | CR-W250T |
|---|---|
| Motor | (2) DC Governor |
| Cassette Loading | (2) Front |
| Drive System | (2) Capstan |
| Number of Heads | 2 / 2 |
| Head Material | Hard Permalloy / Ferrite |
| Operation | (2) Powered Mechanism |
| Wow & Flutter | 0.06 % WRMS |
| High Speed Dubbing | Yes |
| Signal-to-Noise Ratio (CCIR Weighted) | |
| Dolby NR OFF | 51 dB |
| Dolby NR ON B | 61 dB |
| Dolby NR ON C | 70 dB |
| Erase Ratio | 70 dB |
| Channel Separation | 40 dB |
| Signal Crosstalk | 70 dB |
| Frequency Response 1-7/8 IPS | |
| Normal Tape (± 3 dB) | 50 Hz – 13 kHz |
| $CrO_2$ Equivalent Tape (± 3 dB) | 50 Hz – 14 kHz |
| Metal Tape (± 3 dB) | 50 Hz – 15 kHz |
| Total Harmonic Distortion at 0 VU | 1.5 % |
| Fast Forward / Rewind Time (C-60) | 110 sec. |
| Level Indicators | (2) L.E.D. Meters |
| Inputs (Sensitivity / Impedance) | (2) Line<br>100 mV / 50 kΩ |
| Outputs (Level at 0 VU / Impedance) | (2) Line<br>500 mV / 2.2 kΩ |
| Auto Tape Select | Normal, $CrO_2$, Metal |
| Tape Counter | Mechanical |
| **GENERAL** | |
| Power Requirements | AC 220 V 50 Hz |
| Power Consumption | 12 Watts |
| Dimensions (W x H x D) | 400 x 120 x 197 mm |
| Weight (approx.) | 3.1 kg |

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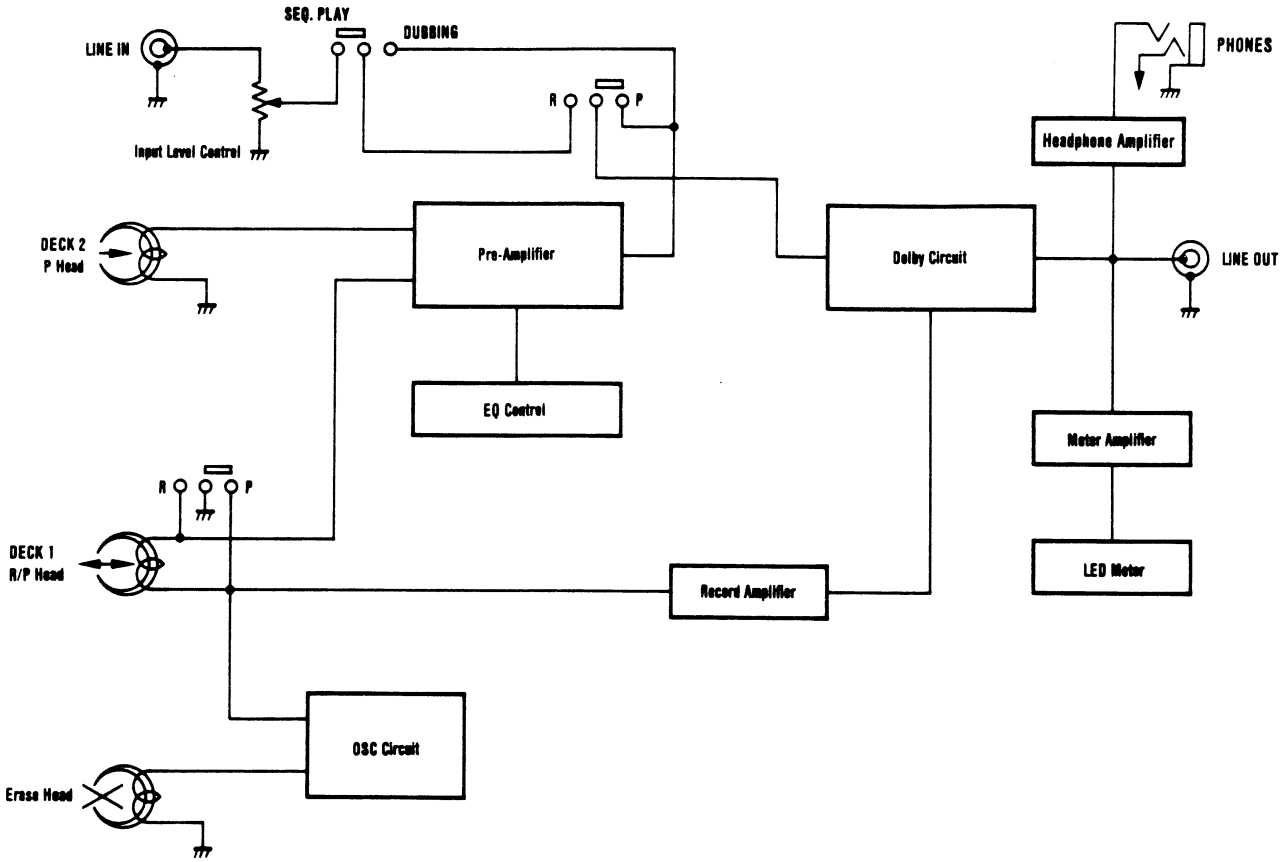
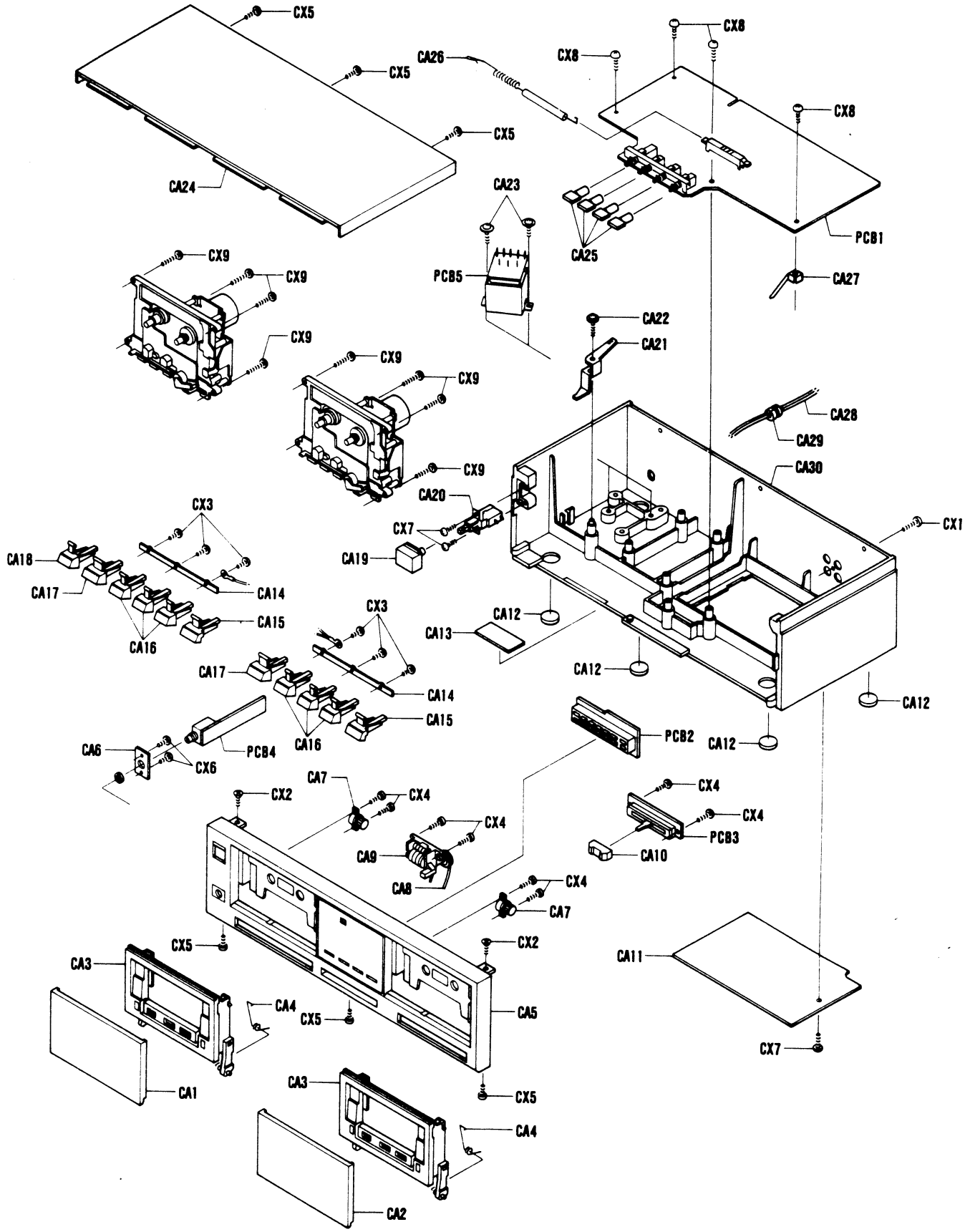
# FUNCTIONAL BLOCK DIAGRAM



# CABINET & CHASSIS EXPLODED VIEW



# CABINET & CHASSIS PARTS LIST

**PRODUCT SAFETY NOTICE**

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol ⚠ in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with ⚠, use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual.
Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

| Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| | **PACKAGE** | | |
| | 141-2-1419-20422 | Rating Plate | 1 |
| | 141-2-1419-21600 | Rating Plate | 1 |
| | 141-6-1419-68962 | Individual Carton | 1 |
| | 141-6-1449-88100 | Case Styrofoam Right | 1 |
| | 141-6-1449-88200 | Case Styrofoam Left | 1 |
| | 141-6-2519-10190 | Poly Cover | 1 |
| | 141-6-4559-03300 | Serial No. Sheet | 2 |
| | **ACCESSORIES** | | |
| | 131-0-4004-15200 | Wire Shield Assy | 1 |
| | 131-0-4004-15201 | Wire Shield Assy | 1 |
| | 141-2-7103-51200 | Label | 2 |
| | 131-6-2719-10401 | Bag Fan | 1 |
| | 142-6-4119-32987 | Instruction Booklet | 1 |
| | **CABINET** | | |
| | 131-2-6114-00200 | Cover Safety | 1 |
| | 141-2-4729-07100 | Wire Band | 8 |
| C327 | ⚠ 4-2239-70970 | Capacitor 0.01μF 400V | 1 |
| CA1 | 141-0-1319-00706 | Lid Cassette Clear Assy | 1 |
| CA2 | 141-0-1319-00707 | Lid Cassette Clear Assy | 1 |
| CA3 | 141-0-1249-33600 | Lid Cassette Assy | 2 |
| CA4 | 141-2-8529-25600 | Spring | 2 |
| CA5 | 141-0-1129-09320 | Cabinet Front Assy | 1 |
| CA6 | 141-2-3679-32700 | Holder Jack | 1 |
| CA7 | 141-0-5519-07902 | Gear Eject Assy | 2 |
| CA8 | 141-2-5649-09400 | Belt Drive | 1 |
| CA9 | 141-2-8119-13300 | Counter | 1 |
| CA10 | 131-2-1601-86503 | Knob (Slide) | 1 |
| CA11 | 141-2-1259-06700 | Sheet Cabinet | 1 |
| CA12 | 131-2-1801-16200 | Leg | 4 |
| CA13 | 131-2-3202-14201 | Metal Reinf | 1 |
| CA14 | 141-2-3519-64200 | Plate Knob | 2 |
| CA15 | 141-2-1659-08500 | Knob Select Stop | 2 |
| CA16 | 141-2-1659-08400 | Knob Select | 6 |
| CA17 | 141-2-1659-08600 | Knob Select Play | 2 |
| CA18 | 141-2-1659-08700 | Knob Select Record | 1 |
| CA19 | 131-2-1601-86200 | Knob | 1 |
| CA20 | ⚠ 4-2312-05051 | Power Switch [S13] | 1 |
| CA21 | 141-2-8419-15500 | Lever Record | 1 |
| CA22 | 131-2-4201-25206 | Screw, M3.0x20 | 1 |
| CA23 | 141-2-4219-22600 | Screw Poly Wave | 2 |
| CA24 | 141-2-1129-15100 | Cover | 1 |
| CA25 | 131-2-1601-70100 | Knob | 4 |
| CA26 | 141-2-8549-32200 | Spring R/P Switch | 1 |
| CA27 | 141-2-8539-55200 | Spring Earth | 1 |
| CA28 | ⚠ 4-2439-70352 | Power Cord | 1 |
| CA29 | 141-2-3899-10400 | Bushing | 1 |
| CA30 | 141-2-3119-25100 | Chassis Cabinet | 1 |

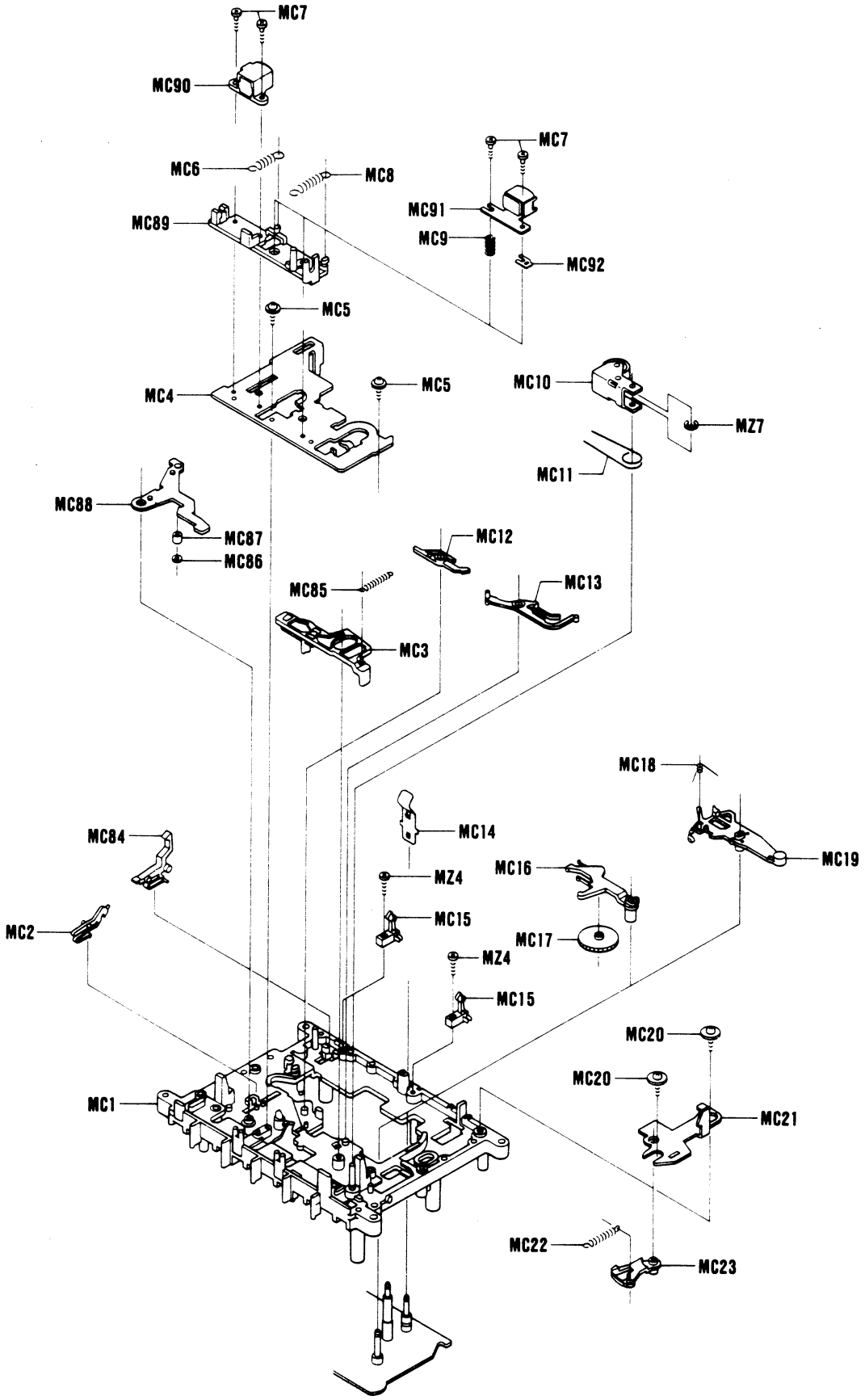
| Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| CX1 | 102-3-1703-01218 | Screw, Bind Hd. Tapping-1, +M3.0x12 | 1 |
| CX2 | 103-3-1203-00811 | Screw, Flat Hd. Tapping-2, +M3.0x8 | 2 |
| CX3 | 143-3-1302-60611 | Screw, Pan Hd. Tapping-B, +M2.6x6 | 6 |
| CX4 | 143-3-1702-60811 | Screw, Bind Hd. Tapping-B, +M2.6x8 | 8 |
| CX5 | 143-3-1703-00818 | Screw, Bind Hd. Tapping-B, +M3.0x8 | 6 |
| CX6 | 143-3-1903-00611 | Screw, Brazier Hd. Tapping-B, +M3.0x6 | 2 |
| CX7 | 143-3-1903-00811 | Screw, Brazier Hd. Tapping-B, +M3.0x8 | 3 |
| CX8 | 143-3-1903-01011 | Screw, Brazier Hd. Tapping-B, +M3.0x10 | 3 |
| CX9 | 143-3-1903-01611 | Screw, Brazier Hd. Tapping-B, +M3.0x16 | 8 |
| PCB1 | 141-0-1939-11424 | Amplifier P.C.B. Assy | 1 |
| PCB2 | 141-0-1939-11432 | LED Meter P.C.B. Assy | 1 |
| PCB3 | 141-0-1939-11441 | Volume P.C.B. Assy | 1 |
| PCB4 | 141-0-1939-11451 | Headphone P.C.B. Assy | 1 |
| PCB5 | 141-0-1939-11192 | Terminal P.C.B. Assy | 1 |

**NOTES:**

1. Parts order must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.

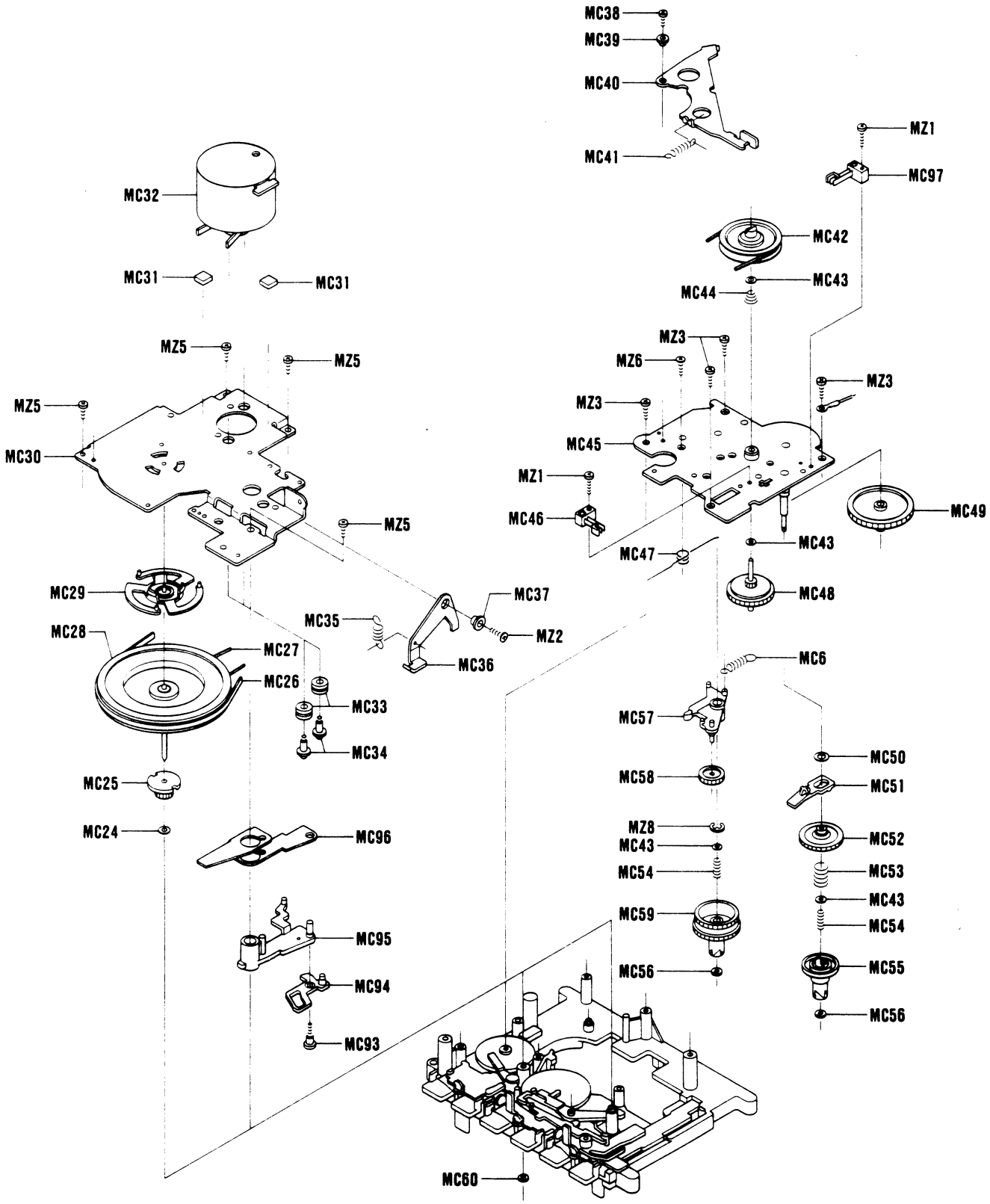
# MECHANISM EXPLODED VIEW

## (DECK 1 TOP)



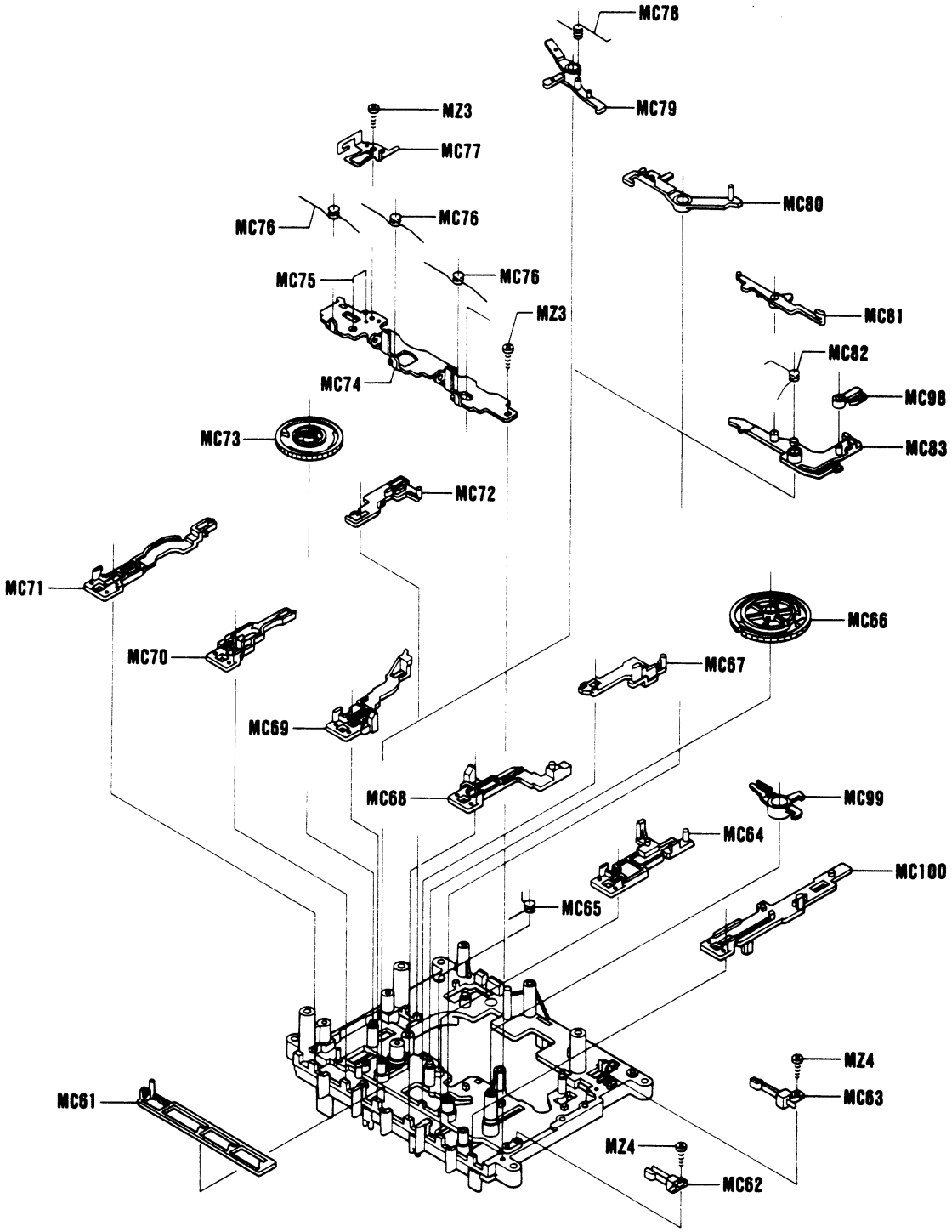
# MECHANISM EXPLODED VIEW

## (DECK 1 BOTTOM-1)

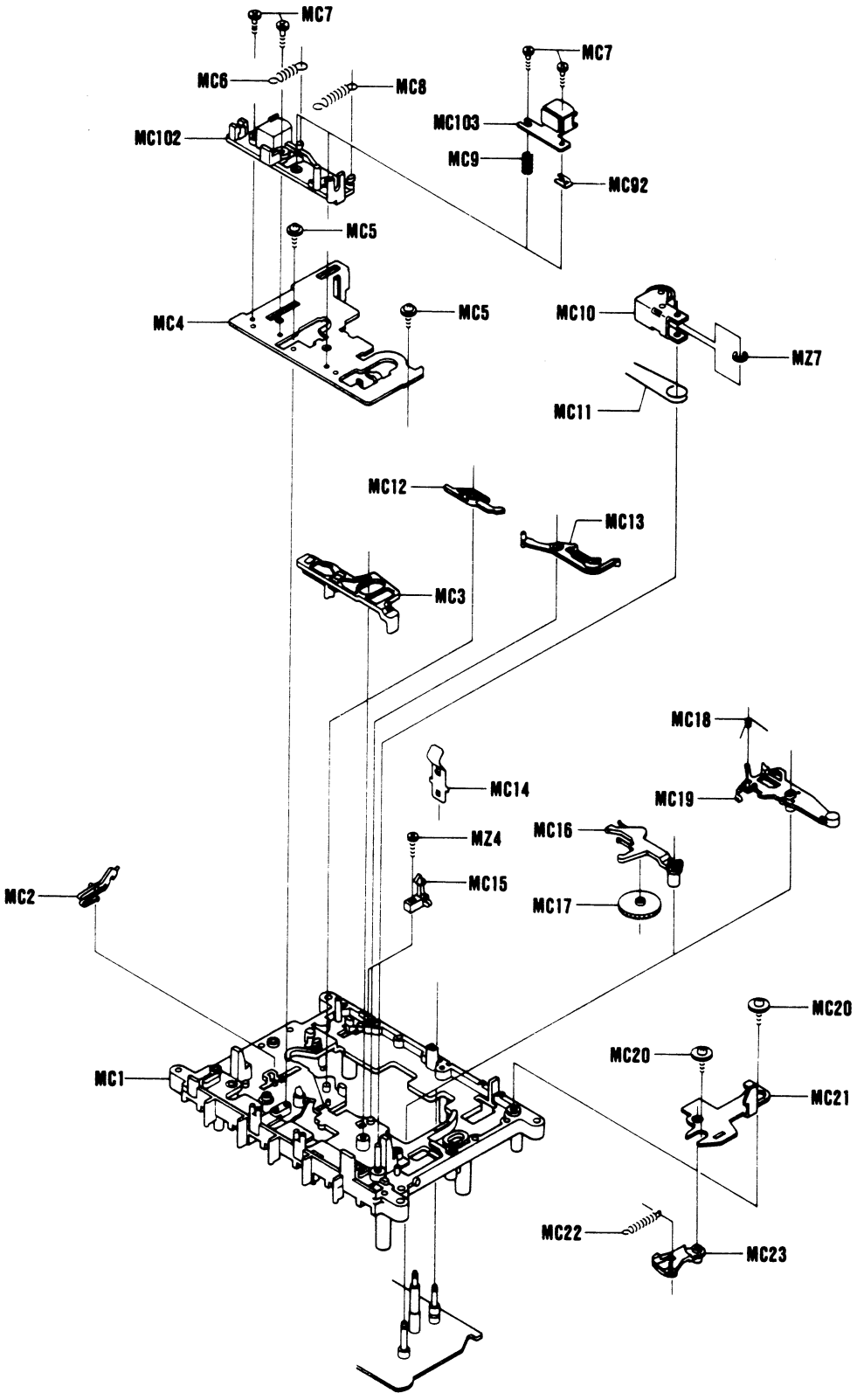


# MECHANISM EXPLODED VIEW

## (DECK 1 BOTTOM-2)

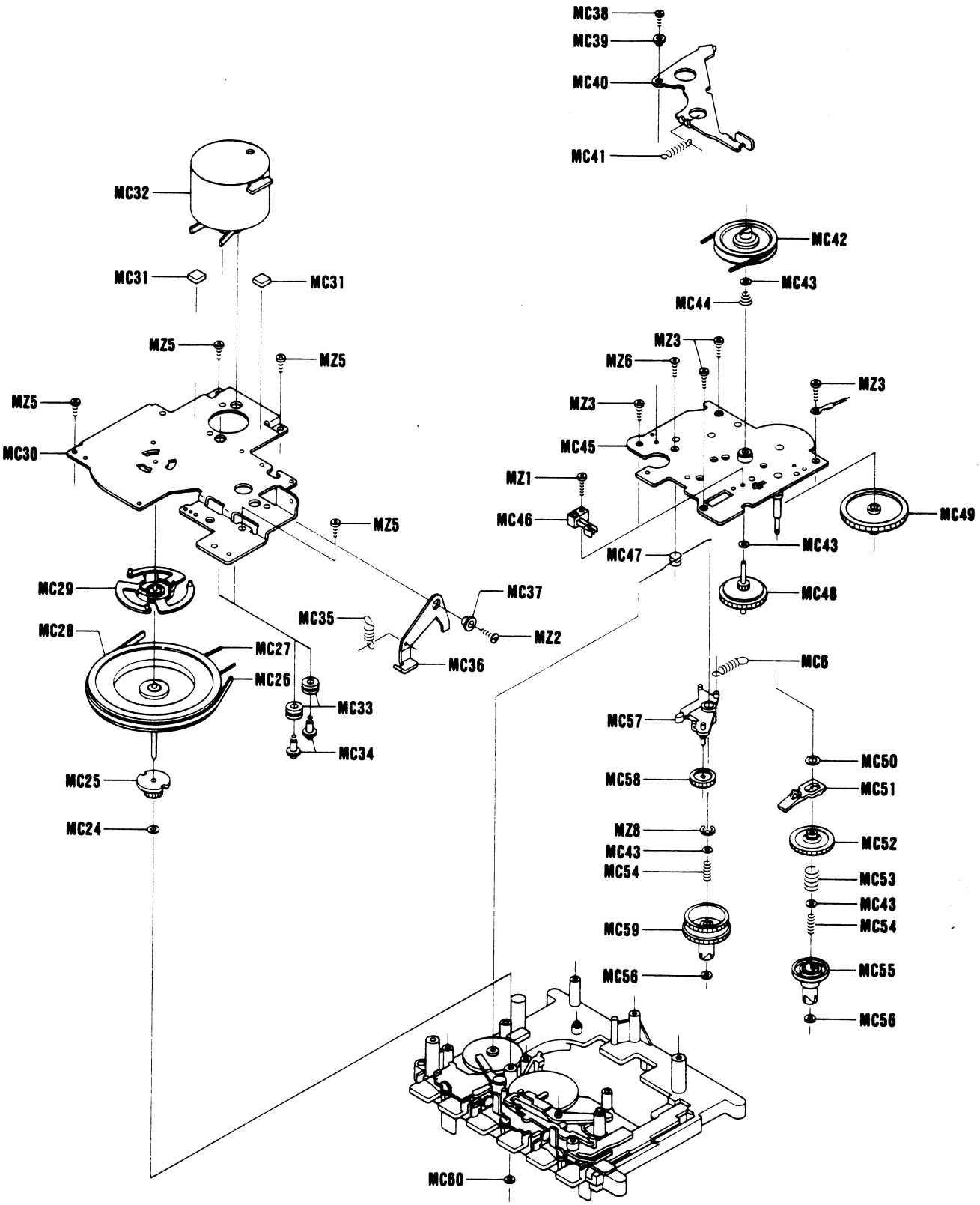


# MECHANISM EXPLODED VIEW
## (DECK 2 TOP)

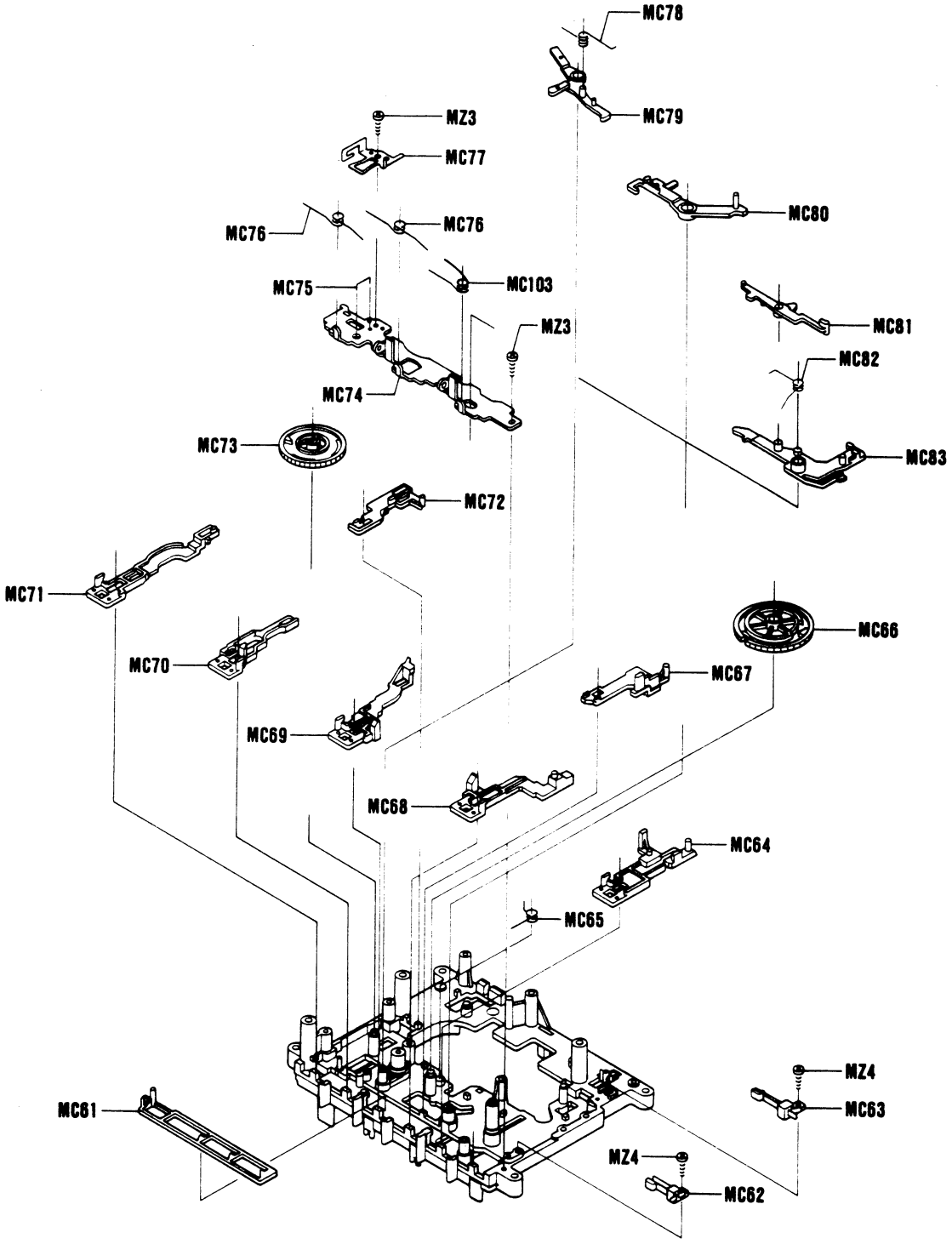


# MECHANISM EXPLODED VIEW

## (DECK 2 BOTTOM-1)



# MECHANISM EXPLODED VIEW
## (DECK 2 BOTTOM-2)



# MECHANISM PARTS LIST

| Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| | **DECK 1 & DECK 2 SIMILAR PARTS** | | |
| | 141-2-4729-04100 | Lug | 2 |
| | 141-2-4729-07000 | Lug | 1 |
| | 4-2359-78440 | Connector 2P Assy [CN1] | 1 |
| | 4-2359-78186 | Connector 3P Assy [CN2] | 1 |
| | 4-2359-78242 | Connector 6P Assy [CN3] | 1 |
| | 4-2359-78407 | Connector 4P Assy [CN4] | 1 |
| | 4-2359-78408 | Connector 4P Assy [CN5] | 1 |
| C1 | CD1-0-6250-0001V | Electrolytic 10μF 25V | 1 |
| C2 | CD1-0-6250-0001V | Electrolytic 10μF 25V | 1 |
| MC1 | 141-0-3119-21900 | Chassis Assy | 2 |
| MC2 | 141-2-7419-81300 | Lever Cassette | 2 |
| MC3 | 141-2-7419-80700 | Lever Base Slide | 2 |
| MC4 | 141-2-7319-52801 | Base Slide | 2 |
| MC5 | 141-2-4219-13201 | Screw Washer | 4 |
| MC6 | 141-2-8519-64900 | Spring Arm Gear | 4 |
| MC7 | 141-2-4219-30300 | Screw, Bind Hd., +M2.0x6 | 8 |
| MC8 | 141-2-8549-18700 | Spring Slide Base | 2 |
| MC9 | 141-2-8559-00201 | Spring Head | 2 |
| MC10 | 141-0-5419-02201 | Pinchroller Assy | 2 |
| MC11 | 141-2-8529-12500 | Spring Pinchroller | 2 |
| MC12 | 141-2-7149-05600 | Brake Supply Reel | 2 |
| MC13 | 141-2-7149-05700 | Brake Take-up Reel | 2 |
| MC14 | 141-2-8539-47901 | Spring Cassette | 2 |
| MC15 | 4-2319-75860 | Leaf Switch (Metal) [S3] | 1 |
| MC15 | 4-2319-75860 | Leaf Switch ($CrO_2$) [S4 & S9] | 2 |
| MC16 | 141-2-7439-30100 | Arm Take-up | 2 |
| MC17 | 141-2-5519-45300 | Gear Take-up | 2 |
| MC18 | 141-2-8529-13200 | Spring Sensor | 2 |
| MC19 | 141-2-7419-80100 | Lever ASO | 2 |
| MC20 | 141-2-4219-05400 | Screw Washer | 4 |
| MC21 | 141-2-7319-59300 | Plate Eject | 2 |
| MC22 | 141-2-8549-18500 | Spring Eject | 2 |
| MC23 | 141-2-7419-81100 | Lever Stop Eject | 2 |
| MC24 | 141-2-4539-20900 | Washer | 2 |
| MC25 | 141-2-5519-45200 | Gear Flywheel | 2 |
| MC26 | 141-2-5619-02000 | Belt | 2 |
| MC27 | 141-2-5649-26800 | Belt Wind | 2 |
| MC28 | 141-2-5219-15000 | Flywheel Capstan | 2 |
| MC29 | 141-2-5739-06100 | Thrust Flywheel | 2 |
| MC30 | 141-2-3519-75300 | Support Flywheel | 2 |
| MC31 | 141-2-4469-21300 | Cushion | 4 |
| MC32 | 4-5279-71238 | Motor [M1 & M2] | 2 |
| MC33 | 141-2-4459-11800 | Cushion Motor | 4 |
| MC34 | 141-2-4219-30100 | Screw | 4 |
| MC35 | 141-2-8549-00600 | Spring Lever Eject | 2 |
| MC36 | 141-2-7419-88900 | Lever Eject | 2 |
| MC37 | 141-2-3529-16000 | Spacer Lever Select | 2 |
| MC38 | 141-2-4219-03000 | Screw | 2 |
| MC39 | 141-2-3529-36100 | Spacer Lever | 2 |
| MC40 | 141-2-7419-82800 | Lever Shut-off Switch | 2 |
| MC41 | 141-2-8519-61100 | Spring Slide | 2 |
| MC42 | 141-2-5519-45700 | Pulley Friction | 2 |
| MC43 | 141-2-4539-27601 | Washer | 8 |
| MC44 | 141-2-8559-04700 | Spring Pulley | 2 |
| MC45 | 141-0-3119-21800 | Plate Chassis Assy | 2 |
| MC46 | 4-2319-74362 | Leaf Switch (Motor) [S7 & S12] | 2 |
| MC47 | 141-2-8529-12700 | Spring Arm F.FWD | 2 |
| MC48 | 141-2-5519-45600 | Gear ASO | 2 |
| MC49 | 141-0-5519-09600 | Friction Assy | 2 |
| MC50 | 141-2-4539-28001 | Washer | 2 |
| MC51 | 141-2-7419-80200 | Lever Rewind | 2 |
| MC52 | 141-2-5319-11600 | Gear Reel Supply | 2 |
| MC53 | 141-2-8519-67900 | Spring Reel | 2 |
| MC54 | 141-2-8559-00100 | Spring Supply | 4 |
| MC55 | 141-2-5319-11700 | Fin Reel Supply | 2 |
| MC56 | 141-2-4539-15700 | Washer | 4 |
| MC57 | 141-2-7439-30000 | Arm Fastwind | 2 |
| MC58 | 141-2-5519-45100 | Gear Fastwind | 2 |
| MC59 | 141-2-5319-11500 | Gear Reel Take-up | 2 |
| MC60 | 141-2-4539-17600 | Washer | 2 |
| MC61 | 141-2-7319-53600 | Plate Lock | 2 |
| MC62 | 4-2319-71863 | Leaf Switch (F.F/Rew) [S6 & S11] | 2 |
| MC63 | 4-2319-74550 | Leaf Switch (Play) [S5 & S10] | 2 |
| MC64 | 141-2-7319-53400 | Rod Play | 2 |
| MC65 | 141-2-8529-12600 | Spring Gear Actuate Play | 2 |
| MC66 | 141-2-5519-45900 | Gear Actuate Play | 2 |
| MC67 | 141-2-7319-52900 | Rod Switch | 2 |
| MC68 | 141-2-7319-53300 | Rod Rewind | 2 |
| MC69 | 141-2-7319-53200 | Rod Fastwind | 2 |
| MC70 | 141-2-7319-53100 | Rod Pause | 2 |
| MC71 | 141-2-7319-53000 | Rod Stop | 2 |
| MC72 | 141-2-7319-54900 | Rod ASO | 2 |
| MC73 | 141-2-5519-45800 | Gear Actuate Pause | 2 |
| MC74 | 141-2-6139-14300 | Frame Rod | 2 |
| MC75 | 141-2-8529-12800 | Spring Pause Latch | 2 |
| MC76 | 141-2-8529-12401 | Spring Rod F.FWD | 5 |
| MC77 | 141-2-8539-46700 | Spring Plate Lock | 2 |
| MC78 | 141-2-8529-13300 | Spring Lever Pause | 2 |
| MC79 | 141-2-7419-80600 | Lever Pause Start | 2 |
| MC80 | 141-2-7419-80500 | Lever Play Start | 2 |
| MC81 | 141-2-7419-80800 | Lever Switch Cue Review | 2 |
| MC82 | 141-2-8529-14200 | Spring Stop Record | 2 |
| MC83 | 141-2-7419-81000 | Lever Stop Record | 2 |
| MC92 | 141-2-3529-18102 | Spacer Head | 2 |
| MZ1 | 101-3-1702-00811 | Screw, Bind Hd., +M2.0x8 | 3 |
| MZ2 | 101-3-1202-60611 | Screw, Flat Hd., +M2.6x6 | 2 |
| MZ3 | 143-3-1702-00618 | Screw, Bind Hd. Tapp.-B, +M2.0x6 | 12 |
| MZ4 | 143-3-1702-00818 | Screw, Bind Hd. Tapp.-B, +M2.0x8 | 7 |
| MZ5 | 143-3-1702-60818 | Screw, Bind Hd. Tapp.-B, +M2.6x8 | 8 |
| MZ6 | 143-3-1202-00818 | Screw, Flat Hd. Tapp.-B, +M2.0x8 | 2 |
| MZ7 | 112-3-1302-00082 | E Ring, M2.0 | 2 |
| MZ8 | 112-3-1303-00082 | E Ring, M3.0 | 2 |
| | **DECK 1 ONLY** | | |
| MC84 | 141-2-8419-11700 | Interlock Lever | 1 |
| MC85 | 141-2-8549-05500 | Spring Lever Stop | 1 |
| MC86 | 141-2-4539-17500 | Washer | 1 |
| MC87 | 141-2-8259-11100 | Roller Record | 1 |
| MC88 | 141-0-7419-36900 | Lever Record Base Assy | 1 |
| MC89 | 141-2-3529-35900 | Speacer Head | 1 |
| MC90 | 4-2429-71880 | Erase Head [HD3] | 1 |
| MC91 | 4-2429-72350 | R/P Head [HD2] | 1 |
| MC93 | 141-2-4219-23000 | Screw | 1 |
| MC94 | 141-2-7419-81200 | Lever Record Select | 1 |
| MC95 | 141-2-7419-81400 | Arm Record | 1 |
| MC96 | 141-2-8419-14400 | Lever Record | 1 |
| MC97 | 4-2319-74360 | Leaf Switch (OSC) [S8] | 1 |
| MC98 | 141-2-7419-80900 | Lever Spring Stop Record | 1 |
| MC99 | 141-2-7419-80400 | Lever Lock Record | 1 |
| MC100 | 141-2-7319-53500 | Rod Record | 1 |
| | **DECK 2 ONLY** | | |
| MC101 | 141-2-3529-46800 | Spacer Head | 1 |
| MC102 | 4-2429-72340 | Play Head [HD1] | 1 |
| MC103 | 141-2-8529-24300 | Spring Rod Play | 1 |

# CASSETTE DECK ELECTRICAL ADJUSTMENTS

## BEFORE ADJUSTMENT

If the tape surface whitch contacts the head, the capstan, and the pinch roller, etc., is stained, it will cause unstable running of the tape, wow and flutter, imperfect recording and erasing, deterioration of tonal quality, and the tape jam around the capstan, etc. Occasionally clean each part as follows;

1. Cut off power.
2. Open the cassette lid.
3. Wipe the head, the capstan, and the pinch roller with a cotton swab. If they are excessively stained, clean them with the swab soaked in absolute alcohol or cleaning liquid on the market.

## MEASURING INSTRUMENTS REQUIRED

- Dualtrace Oscilloscope
- AC VTVM (AC voltmeter with high impedance)
- Dummy Load (47kΩ)
- Frequency Counter
- Signal Oscillator
- Test Tapes
  - ‡ 10kHz Test Tape (Example: TEAC MTT-114) for Azimuth Adjustment
  - ‡ 3kHz Test Tape (Example: TEAC MTT-111) for Normal Tape Speed Adjustment
  - ‡ 1.5kHz Test Tape (Example: A.BEX TCW-211) for Double Tape Speed Adjustment
  - ‡ 400Hz Test Tape (Example: TEAC MTT-150) for Playback Sensitivity Adjustment
- Test Tapes for Recording and Playback Operations
  - ‡ Metal Tape (Example: TDK AC 712)
  - ‡ $CrO_2$ Tape (Example: TDK AC 512)
  - ‡ Normal Tape (Example: TDK AC 223)

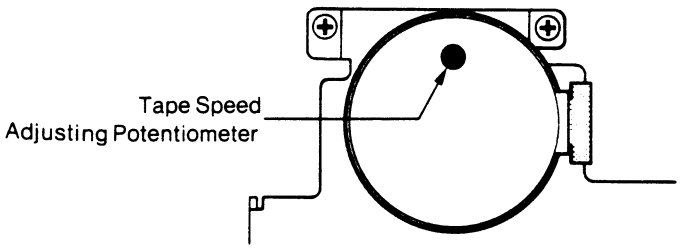
## SWITCH POSITIONS

Unless especially indicated, set each switch as follows;

SYNCHRO START Switch ..... SEQ. PLAY
SPEED Switch ..... NORMAL
DOLBY NR Switch ..... OFF

## NORMAL TAPE SPEED ADJUSTMENT

1. Connect the dummy load (47kΩ) and the frequency counter to the LINE OUT terminal L.
2. Load Deck 1 with a test tape (Example: TEAC MTT-111) and set it in the playback mode.
3 Adjust the potentiometer inside the capstan drive motor, so that the output becomes 3000Hz ±10Hz.
4. Perform the same adjustment for Deck 2.

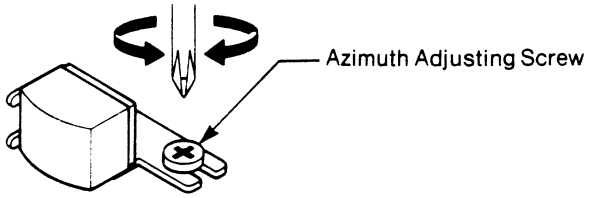



## DOUBLE TAPE SPEED ADJUSTMENT

1. Connect the dummy load (47kΩ) and the frequency counter to the LINE OUT terminal L.
2. Short-circuit TP1 and TP2 with the resistor 8.2kΩ.
3. Load Deck 1 with a test tape (Example: A.BEX TCW-211) and set it in the playback mode.
4 Adjust P302, so that the output frequency becomes 3000Hz ±20Hz.
5. Adjust P301 for Deck 2 with the same method as described in item 3 and 4.

## HEAD AZIMUTH ADJUSTMENT

1. Connect the dummy load (47kΩ) and the dualtrace oscilloscope to the LINE OUT terminals L and R.
2. Load Deck 1 with a test tape (Example: TEAC MTT-114) and set it in the playback mode.
3. Adjust the azimuth adjustment screw, so that the wave forms become maximum on the oscilloscope and the right wave form overlaps with the left one.
4. Perform the same adjustment for Deck 2.



# CASSETTE DECK ELECTRICAL ADJUSTMENTS (Continued)

## PLAYBACK SENSITIVITY ADJUSTMENT

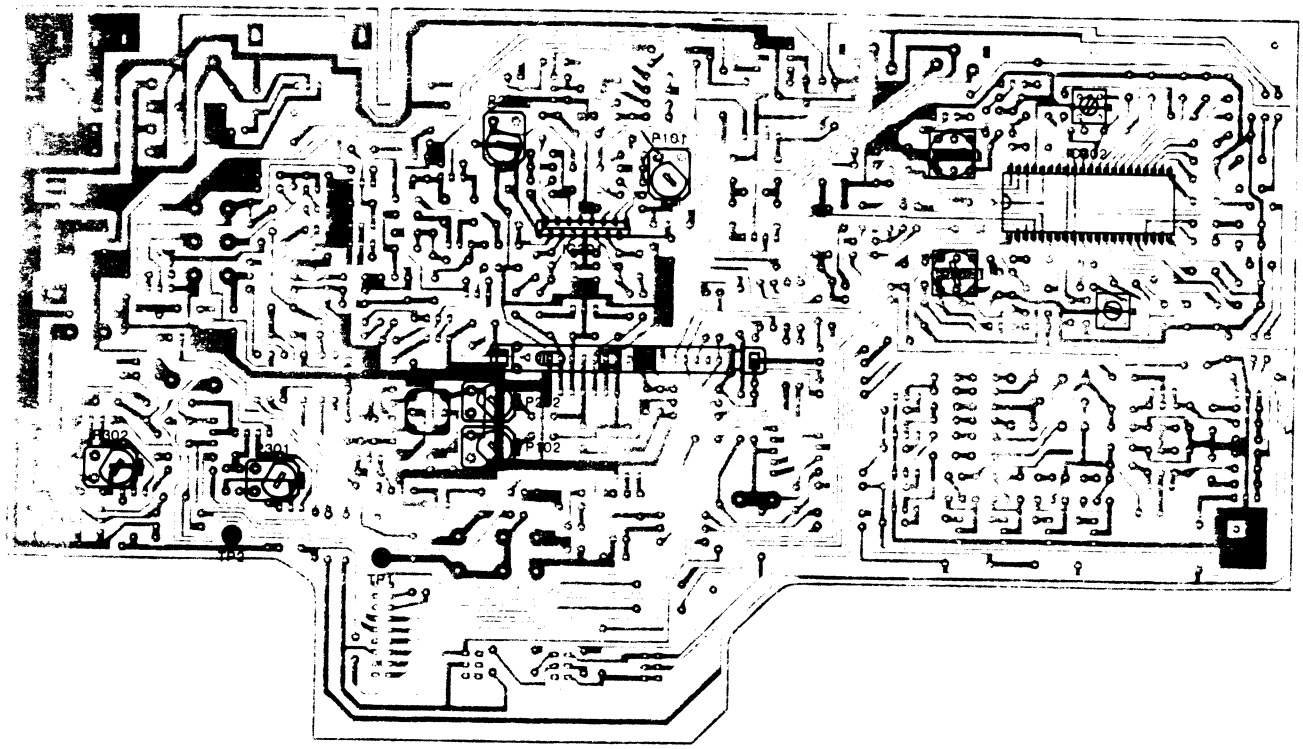
1. Conncet the dummy load (47kΩ) and AC VTVM to the LINE OUT terminal L.
2. Load Deck 1 with a test tape (Example: TEAC MTT-150) and set it in the playback mode.
3. Adjust P101, so that the output of LINE OUT becomes 480mV.
4. Connect AC VTVM to the LINE OUT terminal R and adjust P201, so that the output becomes 480mV.

## BIAS ADJUSTMENT

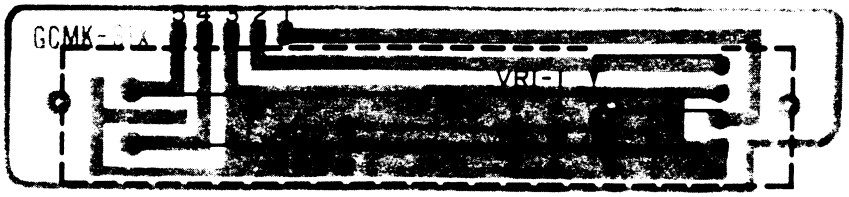
1. Connect the low frequency oscillator to the L side of the LINE IN terminal, and the dummy load (47kΩ) and AC VTVM to the L side of the LINE OUT terminal.
2. Load Deck 1 with a normal tape (Example: TDK AC 223) and set it in the recording mode.
3. Set the Input Level volume control to the maximum position and feed the signals of 1kHz and 12kHz at 7mV from the frequency generator into the unit. Then, record the signals on the tape.
4. Play back the recorded signals adjust P102, so that the difference in output of the 1kHz and 12kHz signals become ±0.5dB.
5. Adjust P202 for the R side by following the same procedures as described for the L side.

# AMPLIFIER P.C.BOARD ALIGNMENT POINTS

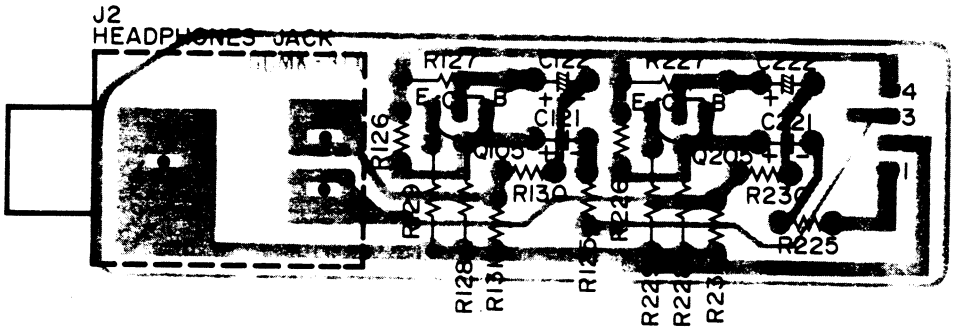
**(TOP VIEW)**



# VOLUME P.C.BOARD
**(BOTTOM VIEW)**

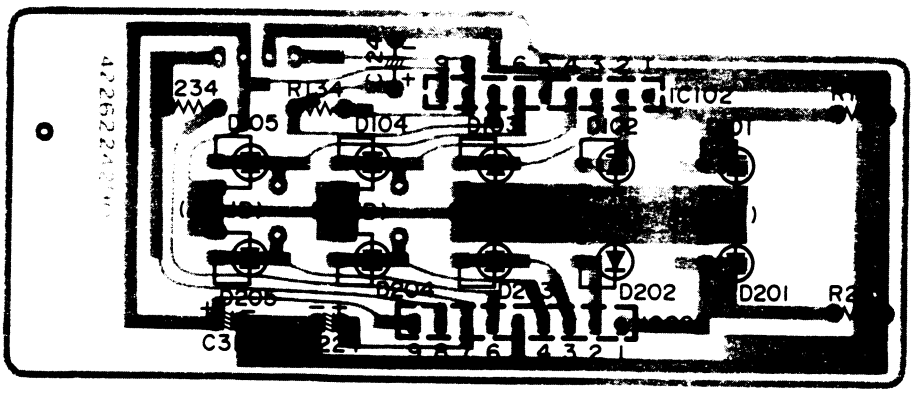


# HEADPHONE P.C.BOARD
**(BOTTOM VIEW)**




| TRANSISTOR DC VOLTAGES | | | | |
|---|---|---|---|---|
| SYMBOL No. | DEVICE | B | C | E |
| Q105,205 | 2SC3331 | 1.0V | 5.4V | 0.4V |

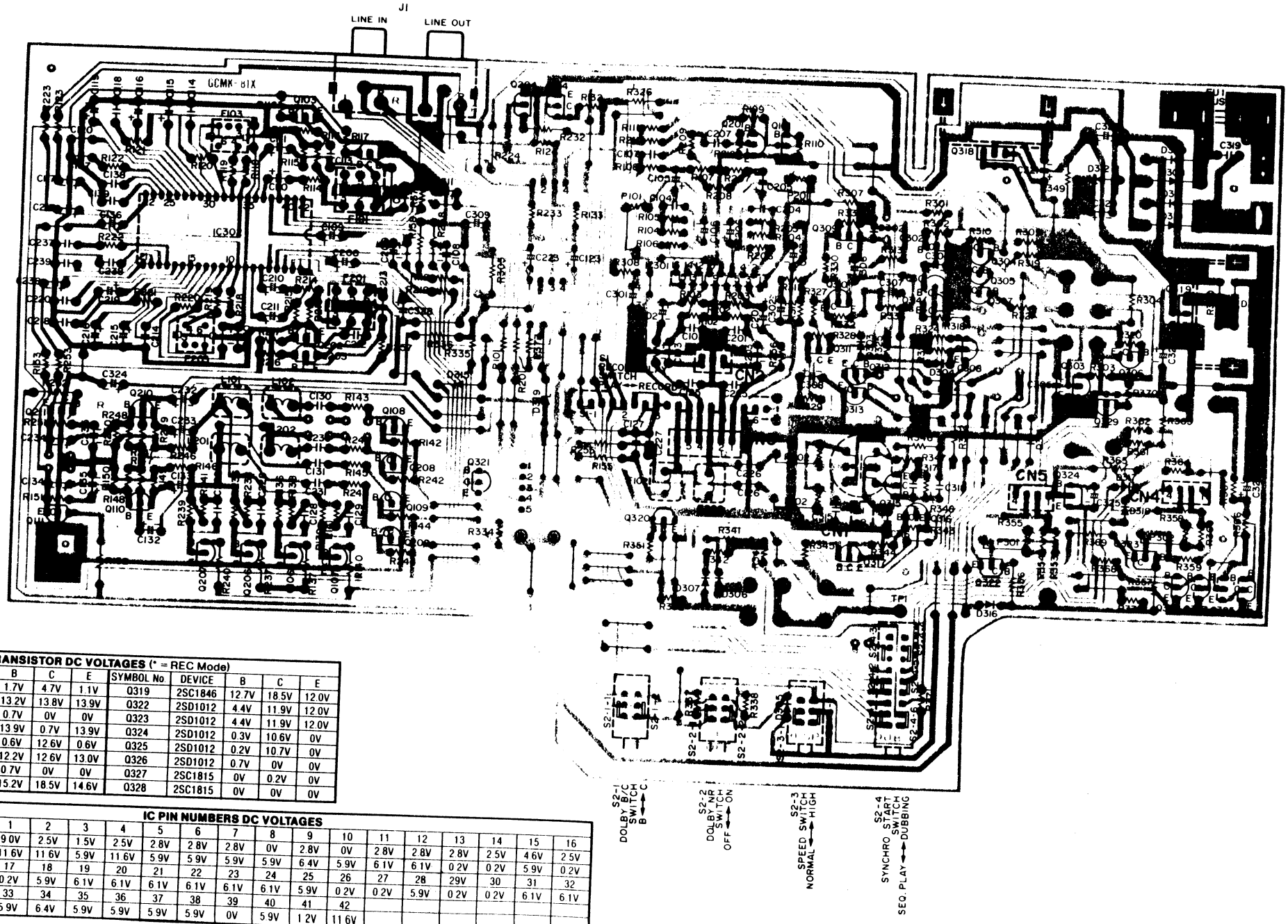
# LED METER P.C.BOARD
**(BOTTOM VIEW)**




| IC PIN NUMBERS DC VOLTAGES | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| SYMBOL No. | DEVICE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| IC102,202 | TA7366P | 10.2V | 10.5V | 10.4V | 10.5V | 0V | 10.5V | 1.4V | 1.4V | 12.0V |

# AMPLIFIER P.C.BOARD

(BOTTOM VIEW)




**TRANSISTOR DC VOLTAGES** (* = REC Mode)

| No. | DEVICE | B | C | E | SYMBOL No. | DEVICE | B | C | E |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2SC3331 | 1.7V | 4.7V | 1.1V | Q319 | 2SC1846 | 12.7V | 18.5V | 12.0V |
| | 2SA608 | 13.2V | 13.8V | 13.9V | Q322 | 2SD1012 | 4.4V | 11.9V | 12.0V |
| | 2SC1815 | 0.7V | 0V | 0V | Q323 | 2SD1012 | 4.4V | 11.9V | 12.0V |
| | 2SA608 | 13.9V | 0.7V | 13.9V | Q324 | 2SD1012 | 0.3V | 10.6V | 0V |
| | 2SC2274 | 0.6V | 12.6V | 0.6V | Q325 | 2SD1012 | 0.2V | 10.7V | 0V |
| | 2SA608 | 12.2V | 12.6V | 13.0V | Q326 | 2SD1012 | 0.7V | 0V | 0V |
| | 2SC1815 | 0.7V | 0V | 0V | Q327 | 2SC1815 | 0V | 0.2V | 0V |
| | 2SC1846 | 15.2V | 18.5V | 14.6V | Q328 | 2SC1815 | 0V | 0V | 0V |

**IC PIN NUMBERS DC VOLTAGES**

| No. | DEVICE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TA7405P | 9.0V | 2.5V | 1.5V | 2.5V | 2.8V | 2.8V | 2.8V | 0V | 2.8V | 0V | 2.8V | 2.8V | 2.8V | 2.5V | 4.6V | 2.5V |
| | CX-20187 | 11.6V | 11.6V | 5.9V | 11.6V | 5.9V | 5.9V | 5.9V | 5.9V | 6.4V | 5.9V | 6.1V | 6.1V | 0.2V | 0.2V | 5.9V | 0.2V |
| | | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29V | 30 | 31 | 32 |
| | | 0.2V | 5.9V | 6.1V | 6.1V | 6.1V | 6.1V | 6.1V | 6.1V | 5.9V | 0.2V | 0.2V | 5.9V | 0.2V | 0.2V | 6.1V | 6.1V |
| | | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | | | | | | |
| | | 5.9V | 6.4V | 5.9V | 5.9V | 5.9V | 5.9V | 0V | 5.9V | 1.2V | 11.6V | | | | | | |

# P.C.BOARD PARTS LIST

| Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| | **AMPLIFIER P.C.B.ASSY** | | |
| PCB1 | 141-0-1939-11424 | Amplifier P.C.B. Assy | 1 |
| | ⚠ 4-2352-01940 | Fuse Clip | 2 |
| | 4-2369-73780 | RT Pin 1P | 20 |
| | 131-2-6201-21500 | Plate Heat Sink (for Q318, Q319) | 2 |
| | 143-3-1903-00811 | Screw, Brazier Hd. Tapping-B, +M3.0x8 | 2 |
| CN1 | 4-2362-00770 | Plug 2P | 1 |
| CN2 | 4-2369-73130 | Connector 3P | 1 |
| CN3 | 4-2369-73160 | Connector 6P | 1 |
| CN4 | 4-2369-73140 | Connector 4P | 1 |
| CN5 | 4-2369-73140 | Connector 4P | 1 |
| F101 | 4-2729-70830 | MPX Filter | 1 |
| F102 | 4-2529-70270 | Bias Trap | 1 |
| F103 | 4-2729-70820 | Skewing Filter | 1 |
| F201 | 4-2729-70830 | MPX Filter | 1 |
| F202 | 4-2529-70270 | Bias Trap | 1 |
| F203 | 4-2729-70820 | Skewing Filter | 1 |
| FU1 | ⚠ 4-2349-70140 | Fuse (T1A) | 1 |
| J1 | 4-2359-75361 | 4P Pin Jack (Line) | 1 |
| S1 | 4-2319-78430 | Slide Switch (Record/Play) | 1 |
| S2 | 4-2319-78141 | Switch Push | 1 |
| L101 | 4-2552-00610 | AF Coil | 1 |
| L102 | 4-2552-00140 | AF Coil | 1 |
| L201 | 4-2552-00610 | AF Coil | 1 |
| L202 | 4-2552-00140 | AF Coil | 1 |
| L301 | 4-2589-72940 | Bias OSC Coil | 1 |
| P101 | 4-2222-01450 | Semi Fixed Volume (B-200Ω) | 1 |
| P102 | 4-2222-01020 | Semi Fixed Volume (B-200kΩ) | 1 |
| P201 | 4-2222-01450 | Semi Fixed Volume (B-200Ω) | 1 |
| P202 | 4-2222-01020 | Semi Fixed Volume (B-200kΩ) | 1 |
| P301 | 4-2222-01450 | Semi Fixed Volume (B-200Ω) | 1 |
| P302 | 4-2222-01450 | Semi Fixed Volume (B-200Ω) | 1 |
| D302 | 4-2029-71440 | Diode, 1SS 95 | 1 |
| D303 | 4-2029-71440 | Diode, 1SS 95 | 1 |
| D304 | 4-2029-71440 | Diode, 1SS 95 | 1 |
| D305 | 4-2029-71440 | Diode, 1SS 95 | 1 |
| D306 | 4-2029-71440 | Diode, 1SS 95 | 1 |
| D307 | 4-2029-71440 | Diode, 1SS 95 | 1 |
| D308 | DYY--1SR3-5-HM- | Diode, 1SR 35 | 1 |
| D309 | DYY--1SR3-5-HM- | Diode, 1SR 35 | 1 |
| D310 | DYY--1SR3-5-HM- | Diode, 1SR 35 | 1 |
| D311 | DYY--1SR3-5-HM- | Diode, 1SR 35 | 1 |
| D312 | 4-2029-74220 | Zener Diode, MTZ 16 A | 1 |
| D313 | 4-2029-74230 | Zener Diode, MTZ 13 A | 1 |
| D314 | 202-5-2810-44210 | Diode, DS 442 | 1 |
| D315 | 202-5-2810-44210 | Diode, DS 442 | 1 |
| D316 | 4-2029-71440 | Diode, 1SS 95 | 1 |
| D317 | 4-2029-71440 | Diode, 1SS 95 | 1 |
| D318 | 4-2029-71440 | Diode, 1SS 95 | 1 |
| D319 | 202-5-3210-11013 | Zener Diode, GZA 11Z | 1 |
| IC301 | 4-2069-74360 | IC, TA7405P | 1 |
| IC302 | 4-2069-74870 | IC, CX-20187 | 1 |
| Q101 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q102 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q103 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q104 | 203-5-4921-01260 | Transistor, 2SD 1012 | 1 |
| Q106 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q107 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q108 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q109 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q110 | 203-5-5083-33165 | Transistor, 2SC 3331 | 1 |
| Q111 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q201 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q202 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q203 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q204 | 203-5-4921-01260 | Transistor, 2SD 1012 | 1 |
| Q206 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q207 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q208 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q209 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q210 | 203-5-5083-33165 | Transistor, 2SC 3331 | 1 |
| Q211 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q301 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q302 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q303 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q304 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q305 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q306 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q307 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q308 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q309 | 203-5-7200-60860 | Transistor, 2SA 608 | 1 |
| Q310 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q311 | 203-5-7200-60860 | Transistor, 2SA 608 | 1 |
| Q312 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q313 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q314 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q315 | 203-5-7252-27460 | Transistor, 2SC 2274 | 1 |
| Q316 | 203-5-7200-60860 | Transistor, 2SA 608 | 1 |
| Q317 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q318 | 4-2039-70600 | Transistor, 2SC 1846 | 1 |
| Q319 | 4-2039-70600 | Transistor, 2SC 1846 | 1 |
| Q320 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q321 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q322 | 203-5-4921-01260 | Transistor, 2SD 1012 | 1 |
| Q323 | 203-5-4921-01260 | Transistor, 2SD 1012 | 1 |
| Q324 | 203-5-4921-01260 | Transistor, 2SD 1012 | 1 |
| Q325 | 203-5-4921-01260 | Transistor, 2SD 1012 | 1 |
| Q326 | 203-5-4921-01260 | Transistor, 2SD 1012 | 1 |
| Q327 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q328 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| Q329 | 4-2039-70431 | Transistor, 2SC 1815 | 1 |
| C101 | CC3-9-1500-KD00C | Ceramic 390pF 50V ±10% | 1 |
| C102 | CD4-7-5250-0KB1V | Electrolytic 4.7μF 25V | 1 |
| C103 | CD4-7-5250-0KB1V | Electrolytic 4.7μF 25V | 1 |
| C104 | CM1-8-3500-K00SV | Mylar 0.018μF 50V ±10% | 1 |
| C105 | CD1-0-6160-0001V | Electrolytic 10μF 16V | 1 |
| C106 | CD1-0-763A-0006V | Electrolytic 100μF 6.3V | 1 |
| C107 | CM1-5-3500-K00SV | Mylar 0.015μF 50V ±10% | 1 |
| C108 | CD2-2-5500-0001V | Electrolytic 2.2μF 50V | 1 |
| C109 | CD2-2-5500-0001V | Electrolytic 2.2μF 50V | 1 |
| C110 | CD4-7-5500-0001V | Electrolytic 4.7μF 50V | 1 |
| C111 | CD2-2-5500-0001V | Electrolytic 2.2μF 50V | 1 |
| C112 | CC6-8-1500-KD00C | Ceramic 680pF 50V ±10% | 1 |
| C113 | CM2-7-2500-K00SV | Mylar 0.0027μF 50V ±10% | 1 |
| C114 | CM4-7-2500-K00SV | Mylar 0.0047μF 50V ±10% | 1 |
| C115 | CD4-7-4500-0KB1V | Electrolytic 0.47μF 50V | 1 |
| C116 | CD1-5-4500-0KB1V | Electrolytic 0.15μF 50V | 1 |
| C117 | CD4-7-5500-0001V | Electrolytic 4.7μF 50V | 1 |
| C118 | CM1-5-3500-K00SV | Mylar 0.015μF 50V ±10% | 1 |
| C119 | CD2-2-4500-0KB1V | Electrolytic 0.22μF 50V | 1 |
| C120 | CM6-8-3500-J00TV | Mylar 0.068μF 50V ±5% | 1 |
| C123 | CD1-0-4500-0001V | Electrolytic 0.1μF 50V | 1 |
| C125 | CC6-8-1500-KD00C | Ceramic 680pF 50V ±10% | 1 |
| C126 | CC1-0-1500-KD00C | Ceramic 100pF 50V ±10% | 1 |
| C127 | CC4-7-1500-KD00C | Ceramic 470pF 50V ±10% | 1 |
| C128 | CM2-7-3500-K00SV | Mylar 0.027μF 50V ±10% | 1 |
| C129 | CM2-7-3500-K00SV | Mylar 0.027μF 50V ±10% | 1 |
| C130 | CM6-8-2500-K00SV | Mylar 0.0068μF 50V ±10% | 1 |

# P.C.BOARD PARTS LIST (Continued)

| Ref. No. | Part No. | Description | | | | Q'ty |
|---|---|---|---|---|---|---|
| C131 | CM1-5-3500-K00SV | Mylar | 0.015μF | 50V | ±10% | 1 |
| C132 | CD1-0-5500-0001V | Electrolytic | 1μF | 50V | | 1 |
| C133 | CD1-0-6160-0001V | Electrolytic | 10μF | 16V | | 1 |
| C134 | CD4-7-4500-0001V | Electrolytic | 0.47μF | 50V | | 1 |
| C135 | CD1-0-5500-0001V | Electrolytic | 1μF | 50V | | 1 |
| C136 | CD4-7-5500-0001V | Electrolytic | 4.7μF | 50V | | 1 |
| C137 | CM4-7-3500-K00SV | Mylar | 0.047μF | 50V | ±10% | 1 |
| C138 | CM6-8-2500-K00SV | Mylar | 0.0068μF | 50V | ±10% | 1 |
| C139 | CM1-0-3500-K00SV | Mylar | 0.01μF | 50V | ±10% | 1 |
| C201 | CC3-9-1500-KD00C | Ceramic | 390pF | 50V | ±10% | 1 |
| C202 | CD4-7-5250-0KB1V | Electrolytic | 4.7μF | 25V | | 1 |
| C203 | CD4-7-5250-0KB1V | Electrolytic | 4.7μF | 25V | | 1 |
| C204 | CM1-8-3500-K00SV | Mylar | 0.018μF | 50V | ±10% | 1 |
| C205 | CD1-0-6160-0001V | Electrolytic | 10μF | 16V | | 1 |
| C206 | CD1-0-763A-0006V | Electrolytic | 100μF | 6.3V | | 1 |
| C207 | CM1-5-3500-K00SV | Mylar | 0.015μF | 50V | ±10% | 1 |
| C208 | CD2-2-5500-0001V | Electrolytic | 2.2μF | 50V | | 1 |
| C209 | CD2-2-5500-0001V | Electrolytic | 2.2μF | 50V | | 1 |
| C210 | CD4-7-5500-0001V | Electrolytic | 4.7μF | 50V | | 1 |
| C211 | CD2-2-5500-0001V | Electrolytic | 2.2μF | 50V | | 1 |
| C212 | CC6-8-1500-KD00C | Ceramic | 680pF | 50V | ±10% | 1 |
| C213 | CM2-7-2500-K00SV | Mylar | 0.0027μF | 50V | ±10% | 1 |
| C214 | CM4-7-2500-K00SV | Mylar | 0.0047μF | 50V | ±10% | 1 |
| C215 | CD4-7-4500-0KB1V | Electrolytic | 0.47μF | 50V | | 1 |
| C216 | CD1-5-4500-0KB1V | Electrolytic | 0.15μF | 50V | | 1 |
| C217 | CD4-7-5500-0001V | Electrolytic | 4.7μF | 50V | | 1 |
| C218 | CM1-5-3500-K00SV | Mylar | 0.015μF | 50V | ±10% | 1 |
| C219 | CD2-2-4500-0KB1V | Electrolytic | 0.22μF | 50V | | 1 |
| C220 | CM6-8-3500-J00TV | Mylar | 0.068μF | 50V | ±5% | 1 |
| C223 | CD1-0-4500-0001V | Electrolytic | 0.1μF | 50V | | 1 |
| C225 | CC6-8-1500-KD00C | Ceramic | 680pF | 50V | ±10% | 1 |
| C226 | CC1-0-1500-KD00C | Ceramic | 100pF | 50V | ±10% | 1 |
| C227 | CC4-7-1500-KD00C | Ceramic | 470pF | 50V | ±10% | 1 |
| C228 | CM2-7-3500-K00SV | Mylar | 0.027μF | 50V | ±10% | 1 |
| C229 | CM2-7-3500-K00SV | Mylar | 0.027μF | 50V | ±10% | 1 |
| C230 | CM6-8-2500-K00SV | Mylar | 0.0068μF | 50V | ±10% | 1 |
| C231 | CM1-5-3500-K00SV | Mylar | 0.015μF | 50V | ±10% | 1 |
| C232 | CD1-0-5500-0001V | Electrolytic | 1μF | 50V | | 1 |
| C233 | CD1-0-6160-0001V | Electrolytic | 10μF | 16V | | 1 |
| C234 | CD4-7-4500-0001V | Electrolytic | 0.47μF | 50V | | 1 |
| C235 | CD1-0-5500-0001V | Electrolytic | 1μF | 50V | | 1 |
| C236 | CD4-7-5500-0001V | Electrolytic | 4.7μF | 50V | | 1 |
| C237 | CM4-7-3500-K00SV | Mylar | 0.047μF | 50V | ±10% | 1 |
| C238 | CM6-8-2500-K00SV | Mylar | 0.0068μF | 50V | ±10% | 1 |
| C239 | CM1-0-3500-K00SV | Mylar | 0.01μF | 50V | ±10% | 1 |
| C301 | CD1-0-6160-0001V | Electrolytic | 10μF | 16V | | 1 |
| C302 | CD4-7-5500-0001V | Electrolytic | 4.7μF | 50V | | 1 |
| C303 | CD1-0-7160-0006V | Electrolytic | 100μF | 16V | | 1 |
| C304 | CD1-0-763A-0006V | Electrolytic | 100μF | 6.3V | | 1 |
| C305 | CD4-7-663A-0001V | Electrolytic | 47μF | 6.3V | | 1 |
| C306 | CD2-2-7160-0001V | Electrolytic | 220μF | 16V | | 1 |
| C307 | CD4-7-6250-0001V | Electrolytic | 47μF | 25V | | 1 |
| C308 | CD1-0-6160-0001V | Electrolytic | 10μF | 16V | | 1 |
| C309 | CD2-2-7160-0001V | Electrolytic | 220μF | 16V | | 1 |
| C310 | CD2-2-7100-0001V | Electrolytic | 220μF | 10V | | 1 |
| C311 | CD1-0-6160-0001V | Electrolytic | 10μF | 16V | | 1 |
| C315 | CP1-2-3101-J000V | Polypropylen | 0.012μF | 100V | ±5% | 1 |
| C316 | CD1-0-6160-0001V | Electrolytic | 10μF | 16V | | 1 |
| C317 | CM2-2-3500-K00SV | Mylar | 0.022μF | 50V | ±10% | 1 |
| C318 | CM1-0-3500-K00SV | Mylar | 0.01μF | 50V | ±10% | 1 |
| C319 | CC2-2-3500-ZG00C | Ceramic | 0.022μF | 50V | +80,-20% | 1 |
| C320 | CD4-7-7160-0001V | Electrolytic | 470μF | 16V | | 1 |
| C321 | CD1-0-7160-0006V | Electrolytic | 100μF | 16V | | 1 |
| C322 | CD1-0-8250-0001V | Electrolytic | 1000μF | 25V | | 1 |

| Ref. No. | Part No. | Description | | | Q'ty |
|---|---|---|---|---|---|
| C323 | CD4-7-6160-0001V | Electrolytic | 47μF | 16V | 1 |
| C324 | CD4-7-6160-0001V | Electrolytic | 47μF | 16V | 1 |
| C325 | CD4-7-663A-0001V | Electrolytic | 47μF | 6.3V | 1 |
| C326 | CD4-7-5500-0001V | Electrolytic | 4.7μF | 50V | 1 |
| C328 | CD1-0-5500-0001V | Electrolytic | 1μF | 50V | 1 |
| R101 | 401 017 2801 | CARBON 27K JA 1/4W | | | 1 |
| R102 | 401 028 4207 | CARBON 100K JA 1/8W | | | 1 |
| R103 | 401 028 4207 | CARBON 100K JA 1/8W | | | 1 |
| R104 | 401 032 8703 | CARBON 8.2K JA 1/8W | | | 1 |
| R105 | 401 032 4606 | CARBON 6.8K JA 1/8W | | | 1 |
| R106 | 401 030 5209 | CARBON 270K JA 1/8W | | | 1 |
| R107 | 401 028 3200 | CARBON 1K JA 1/8W | | | 1 |
| R108 | 401 030 0204 | CARBON 2.2K JA 1/8W | | | 1 |
| R109 | 401 031 6601 | CARBON 4.7K JA 1/8W | | | 1 |
| R110 | 401 030 1300 | CARBON 220K JA 1/8W | | | 1 |
| R111 | 401 030 9702 | CARBON 33K JA 1/8W | | | 1 |
| R112 | 401 032 6808 | CARBON 7.5K JA 1/8W | | | 1 |
| R113 | 401 032 2909 | CARBON 6.2K JA 1/8W | | | 1 |
| R114 | 401 032 4606 | CARBON 6.8K JA 1/8W | | | 1 |
| R115 | 401 032 6808 | CARBON 7.5K JA 1/8W | | | 1 |
| R116 | 401 028 3200 | CARBON 1K JA 1/8W | | | 1 |
| R117 | 401 028 3200 | CARBON 1K JA 1/8W | | | 1 |
| R118 | 401 031 2405 | CARBON 3.9K JA 1/8W | | | 1 |
| R119 | 401 031 4508 | CARBON 430 JA 1/8W | | | 1 |
| R120 | 401 030 4202 | CARBON 2.7K JA 1/8W | | | 1 |
| R121 | 401 032 4606 | CARBON 6.8K JA 1/8W | | | 1 |
| R122 | 401 032 4002 | CARBON 680 JA 1/8W | | | 1 |
| R123 | 401 030 0204 | CARBON 2.2K JA 1/8W | | | 1 |
| R124 | 401 031 7202 | CARBON 47K JA 1/8W | | | 1 |
| R132 | 401 028 3200 | CARBON 1K JA 1/8W | | | 1 |
| R133 | 401 031 7202 | CARBON 47K JA 1/8W | | | 1 |
| R136 | 401 029 0901 | CARBON 1.5K JA 1/8W | | | 1 |
| R137 | 401 018 4903 | CARBON 33K JA 1/4W | | | 1 |
| R138 | 401 031 6601 | CARBON 4.7K JA 1/8W | | | 1 |
| R139 | 401 031 6601 | CARBON 4.7K JA 1/8W | | | 1 |
| R140 | 401 012 7009 | CARBON 10K JA 1/4W | | | 1 |
| R141 | 401 030 9207 | CARBON 3.3K JA 1/8W | | | 1 |
| R142 | 401 030 9702 | CARBON 33K JA 1/8W | | | 1 |
| R143 | 401 028 6607 | CARBON 120 JA 1/8W | | | 1 |
| R144 | 401 028 3200 | CARBON 1K JA 1/8W | | | 1 |
| R145 | 401 030 3700 | CARBON 270 JA 1/8W | | | 1 |
| R146 | 401 030 1300 | CARBON 220K JA 1/8W | | | 1 |
| R147 | 401 028 3705 | CARBON 10K JA 1/8W | | | 1 |
| R148 | 401 030 1300 | CARBON 220K JA 1/8W | | | 1 |
| R149 | 401 028 7109 | CARBON 1.2K JA 1/8W | | | 1 |
| R150 | 401 030 9702 | CARBON 33K JA 1/8W | | | 1 |
| R151 | 401 030 0204 | CARBON 2.2K JA 1/8W | | | 1 |
| R152 | 401 012 5708 | CARBON 1K JA 1/4W | | | 1 |
| R153 | 401 030 0204 | CARBON 2.2K JA 1/8W | | | 1 |
| R155 | 401 013 6407 | CARBON 12K JA 1/4W | | | 1 |
| R156 | 401 028 3200 | CARBON 1K JA 1/8W | | | 1 |
| R157 | 401 030 1300 | CARBON 220K JA 1/8W | | | 1 |
| R158 | 401 021 3009 | CARBON 5.6K JA 1/4W | | | 1 |
| R201 | 401 017 2801 | CARBON 27K JA 1/4W | | | 1 |
| R202 | 401 028 4207 | CARBON 100K JA 1/8W | | | 1 |
| R203 | 401 028 4207 | CARBON 100K JA 1/8W | | | 1 |
| R204 | 401 032 8703 | CARBON 8.2K JA 1/8W | | | 1 |
| R205 | 401 032 4606 | CARBON 6.8K JA 1/8W | | | 1 |
| R206 | 401 030 5209 | CARBON 270K JA 1/8W | | | 1 |
| R207 | 401 028 3200 | CARBON 1K JA 1/8W | | | 1 |
| R208 | 401 030 0204 | CARBON 2.2K JA 1/8W | | | 1 |
| R209 | 401 031 6601 | CARBON 4.7K JA 1/8W | | | 1 |
| R210 | 401 030 1300 | CARBON 220K JA 1/8W | | | 1 |
| R211 | 401 030 9702 | CARBON 33K JA 1/8W | | | 1 |

# P.C.BOARD PARTS LIST (Continued)

| Ref. No. | Part No. | Description | Q'ty |
|---|---|---|---|
| R212 | 401 032 6808 | CARBON 7.5K JA 1/8W | 1 |
| R213 | 401 032 2909 | CARBON 6.2K JA 1/8W | 1 |
| R214 | 401 032 4606 | CARBON 6.8K JA 1/8W | 1 |
| R215 | 401 032 6808 | CARBON 7.5K JA 1/8W | 1 |
| R216 | 401 028 3200 | CARBON 1K JA 1/8W | 1 |
| R217 | 401 028 3200 | CARBON 1K JA 1/8W | 1 |
| R218 | 401 031 2405 | CARBON 3.9K JA 1/8W | 1 |
| R219 | 401 031 4508 | CARBON 430 JA 1/8W | 1 |
| R220 | 401 030 4202 | CARBON 2.7K JA 1/8W | 1 |
| R221 | 401 032 4606 | CARBON 6.8K JA 1/8W | 1 |
| R222 | 401 032 4002 | CARBON 680 JA 1/8W | 1 |
| R223 | 401 030 0204 | CARBON 2.2K JA 1/8W | 1 |
| R224 | 401 031 7202 | CARBON 47K JA 1/8W | 1 |
| R232 | 401 012 5708 | CARBON 1K JA 1/4W | 1 |
| R233 | 401 031 7202 | CARBON 47K JA 1/8W | 1 |
| R236 | 401 029 0901 | CARBON 1.5K JA 1/8W | 1 |
| R237 | 401 018 4903 | CARBON 33K JA 1/4W | 1 |
| R238 | 401 031 6601 | CARBON 4.7K JA 1/8W | 1 |
| R239 | 401 031 6601 | CARBON 4.7K JA 1/8W | 1 |
| R240 | 401 012 7009 | CARBON 10K JA 1/4W | 1 |
| R241 | 401 030 9207 | CARBON 3.3K JA 1/8W | 1 |
| R242 | 401 030 9702 | CARBON 33K JA 1/8W | 1 |
| R243 | 401 028 6607 | CARBON 120 JA 1/8W | 1 |
| R244 | 401 028 3200 | CARBON 1K JA 1/8W | 1 |
| R245 | 401 030 3700 | CARBON 270 JA 1/8W | 1 |
| R246 | 401 030 1300 | CARBON 220K JA 1/8W | 1 |
| R247 | 401 028 3705 | CARBON 10K JA 1/8W | 1 |
| R248 | 401 030 1300 | CARBON 220K JA 1/8W | 1 |
| R249 | 401 028 7109 | CARBON 1.2K JA 1/8W | 1 |
| R250 | 401 030 9702 | CARBON 33K JA 1/8W | 1 |
| R251 | 401 030 0204 | CARBON 2.2K JA 1/8W | 1 |
| R252 | 401 012 5708 | CARBON 1K JA 1/4W | 1 |
| R253 | 401 030 0204 | CARBON 2.2K JA 1/8W | 1 |
| R255 | 401 013 6407 | CARBON 12K JA 1/4W | 1 |
| R256 | 401 028 3200 | CARBON 1K JA 1/8W | 1 |
| R257 | 401 030 1300 | CARBON 220K JA 1/8W | 1 |
| R258 | 401 021 3009 | CARBON 5.6K JA 1/4W | 1 |
| R301 | 401 029 2004 | CARBON 150K JA 1/8W | 1 |
| R302 | 401 030 9702 | CARBON 33K JA 1/8W | 1 |
| R303 | 401 030 9702 | CARBON 33K JA 1/8W | 1 |
| R304 | 401 023 2802 | CARBON 8.2K JA 1/4W | 1 |
| R305 | 401 012 4503 | CARBON 100 JA 1/4W | 1 |
| R307 | 401 012 5708 | CARBON 1K JA 1/4W | 1 |
| R308 | 401 028 4207 | CARBON 100K JA 1/8W | 1 |
| R309 | 401 028 4207 | CARBON 100K JA 1/8W | 1 |
| R310 | 401 031 7202 | CARBON 47K JA 1/8W | 1 |
| R311 | 401 028 4207 | CARBON 100K JA 1/8W | 1 |
| R312 | 401 028 7604 | CARBON 12K JA 1/8W | 1 |
| R313 | 401 028 4207 | CARBON 100K JA 1/8W | 1 |
| R314 | 401 018 4903 | CARBON 33K JA 1/4W | 1 |
| R316 | 401 018 4903 | CARBON 33K JA 1/4W | 1 |
| R318 | 401 020 2904 | CARBON 47K JA 1/4W | 1 |
| R319 | 401 030 0709 | CARBON 22K JA 1/8W | 1 |
| R320 | 401 030 4202 | CARBON 2.7K JA 1/8W | 1 |
| R321 | 401 030 4202 | CARBON 2.7K JA 1/8W | 1 |
| R322 | 401 018 4903 | CARBON 33K JA 1/4W | 1 |
| R323 | 401 030 9207 | CARBON 3.3K JA 1/8W | 1 |
| R324 | 401 029 2004 | CARBON 150K JA 1/8W | 1 |
| R325 | 401 030 0709 | CARBON 22K JA 1/8W | 1 |
| R326 | 401 017 1804 | CARBON 2.7K JA 1/4W | 1 |
| R327 | 401 030 0709 | CARBON 22K JA 1/8W | 1 |
| R328 | 401 030 0709 | CARBON 22K JA 1/8W | 1 |
| R329 | 401 030 0709 | CARBON 22K JA 1/8W | 1 |
| R330 | 401 030 0709 | CARBON 22K JA 1/8W | 1 |
| R331 | 401 031 7202 | CARBON 47K JA 1/8W | 1 |
| R332 | 401 030 0709 | CARBON 22K JA 1/8W | 1 |
| R333 | 401 030 0709 | CARBON 22K JA 1/8W | 1 |
| R334 | 401 030 9702 | CARBON 33K JA 1/8W | 1 |
| R335 | 401 021 3009 | CARBON 5.6K JA 1/4W | 1 |
| R336 | 401 018 2800 | CARBON 330 JA 1/4W | 1 |
| R337 | 401 030 0709 | CARBON 22K JA 1/8W | 1 |
| R338 | 401 028 3705 | CARBON 10K JA 1/8W | 1 |
| R340 | 401 030 8705 | CARBON 330 JA 1/8W | 1 |
| R341 | 401 012 2905 | CARBON 10 JA 1/4W | 1 |
| R342 | 401 031 6106 | CARBON 470 JA 1/8W | 1 |
| R343 | 401 030 9207 | CARBON 3.3K JA 1/8W | 1 |
| R344 | 401 028 3705 | CARBON 10K JA 1/8W | 1 |
| R345 | 401 030 9702 | CARBON 33K JA 1/8W | 1 |
| R346 | 401 012 2905 | CARBON 10 JA 1/4W | 1 |
| R347 | 401 032 3500 | CARBON 68 JA 1/8W | 1 |
| R348 | 401 028 3705 | CARBON 10K JA 1/8W | 1 |
| R349 | 401 021 1500 | CARBON 560 JA 1/4W | 1 |
| R350 | 401 021 1500 | CARBON 560 JA 1/4W | 1 |
| R351 | 401 030 9702 | CARBON 33K JA 1/8W | 1 |
| R352 | 401 028 7604 | CARBON 12K JA 1/8W | 1 |
| R353 | 401 031 1903 | CARBON 390 JA 1/8W | 1 |
| R354 | 401 028 2609 | CARBON 100 JA 1/8W | 1 |
| R355 | 4-2219-70363 | LT Resistor 1K | 1 |
| R356 | 401 017 2801 | CARBON 27K JA 1/4W | 1 |
| R357 | 401 017 2801 | CARBON 27K JA 1/4W | 1 |
| R358 | 4-2219-70363 | LT Resistor 1K | 1 |
| R359 | 401 031 1903 | CARBON 390 JA 1/8W | 1 |
| R360 | 401 028 2609 | CARBON 100 JA 1/8W | 1 |
| R361 | 401 030 9207 | CARBON 3.3K JA 1/8W | 1 |
| R362 | 401 030 9207 | CARBON 3.3K JA 1/8W | 1 |
| R363 | 401 018 3807 | CARBON 3.3K JA 1/4W | 1 |
| R364 | 401 030 9207 | CARBON 3.3K JA 1/8W | 1 |
| R365 | 401 014 4105 | CARBON 1.5K JA 1/4W | 1 |
| R366 | 401 030 9207 | CARBON 3.3K JA 1/8W | 1 |
| R367 | 401 028 2609 | CARBON 100 JA 1/8W | 1 |
| R368 | 401 028 3705 | CARBON 10K JA 1/8W | 1 |
| R369 | 401 016 3809 | CARBON 2.2K JA 1/4W | 1 |
| R370 | 401 030 9702 | CARBON 33K JA 1/8W | 1 |
| R371 | 401 032 8703 | CARBON 8.2K JA 1/8W | 1 |
| R372 | 401 030 0709 | CARBON 22K JA 1/8W | 1 |
| R373 | 401 016 4806 | CARBON 22K JA 1/4W | 1 |
| R374 | 401 028 4207 | CARBON 100K JA 1/8W | 1 |

### LED METER P.C.B. ASSY

| | | | | | |
|---|---|---|---|---|---|
| PCB2 | 141-0-1939-11432 | LED Meter P.C.B. Assy | | | 1 |
| | 141-2-3749-10600 | Shelter | | | 1 |
| | 131-2-9800-01014 | Jumper | | | 1 |
| D101 | 4-2029-73221 | LED, SLP-165B (-10dB) | | | 1 |
| D102 | 4-2029-73221 | LED, SLP-165B (-5dB) | | | 1 |
| D103 | 4-2029-73221 | LED, SLP-165B (0dB) | | | 1 |
| D104 | 4-2029-73221 | LED, SLP-165B (+3dB) | | | 1 |
| D105 | 4-2029-73221 | LED, SLP-165B (+6dB) | | | 1 |
| D201 | 4-2029-73221 | LED, SLP-165B (-10dB) | | | 1 |
| D202 | 4-2029-73221 | LED, SLP-165B (-5dB) | | | 1 |
| D203 | 4-2029-73221 | LED, SLP-165B (0dB) | | | 1 |
| D204 | 4-2029-73221 | LED, SLP-165B (+3dB) | | | 1 |
| D205 | 4-2029-73221 | LED, SLP-165B (+6dB) | | | 1 |
| IC102 | 4-2069-74370 | IC, TA7366P | | | 1 |
| IC202 | 4-2069-74370 | IC, TA7366P | | | 1 |
| C124 | CD1-0-5500-0002V | Electrolytic | 1μF | 50V | 1 |
| C224 | CD1-0-5500-0002V | Electrolytic | 1μF | 50V | 1 |
| C312 | CD1-0-6160-0002V | Electrolytic | 10μF | 16V | 1 |

# P.C.BOARD PARTS LIST (Continued)

| Ref. No. | Part No. | Description | | | Q'ty |
|---|---|---|---|---|---|
| R134 | 401 032 1100 | CARBON 56K JA 1/8W | | | 1 |
| R135 | 401 031 6601 | CARBON 4.7K JA 1/8W | | | 1 |
| R234 | 401 032 1100 | CARBON 56K JA 1/8W | | | 1 |
| R235 | 401 031 6601 | CARBON 4.7K JA 1/8W | | | 1 |
| | **VOLUME P.C.B. ASSY** | | | | |
| PCB3 | 141-0-1939-11441 | Volume P.C.B. Assy | | | 1 |
| | 4-2439-72175 | Wire 5 Parallel | | | 1 |
| VR1 | 4-2229-75650 | Slide Volume (Input Level, A-50kΩ) | | | 1 |
| | **HEADPHONE P.C.B. ASSY** | | | | |
| PCB4 | 141-0-1939-11451 | Headphone P.C.B. Assy | | | 1 |
| | 131-2-9800-01826 | Jumper | | | 1 |
| J2 | 4-2359-76380 | Jack 3P (Headphones) | | | 1 |
| Q105 | 203-5-5083-33160 | Transistor, 2SC 3331 | | | 1 |
| Q205 | 203-5-5083-33160 | Transistor, 2SC 3331 | | | 1 |
| C121 | CD1-0-6160-0001V | Electrolytic | 10μF | 16V | 1 |
| C122 | CD1-0-6160-0001V | Electrolytic | 10μF | 16V | 1 |
| C221 | CD1-0-6160-0002V | Electrolytic | 10μF | 16V | 1 |
| C222 | CD1-0-6160-0002V | Electrolytic | 10μF | 16V | 1 |
| R125 | 401 029 1502 | CARBON 15K JA 1/8W | | | 1 |
| R126 | 401 028 4207 | CARBON 100K JA 1/8W | | | 1 |
| R127 | 401 021 1906 | CARBON 560 JA 1/4W | | | 1 |
| R128 | 401 013 6407 | CARBON 12K JA 1/4W | | | 1 |
| R129 | 401 016 1508 | CARBON 22 JA 1/4W | | | 1 |
| R130 | 401 032 3500 | CARBON 68 JA 1/8W | | | 1 |
| R131 | 401 028 3200 | CARBON 1K JA 1/8W | | | 1 |
| R225 | 401 029 1502 | CARBON 15K JA 1/8W | | | 1 |
| R226 | 401 028 4207 | CARBON 100K JA 1/8W | | | 1 |
| R227 | 401 021 1906 | CARBON 560 JA 1/4W | | | 1 |
| R228 | 401 013 6407 | CARBON 12K JA 1/4W | | | 1 |
| R229 | 401 016 1508 | CARBON 22 JA 1/4W | | | 1 |
| R230 | 401 032 3500 | CARBON 68 JA 1/8W | | | 1 |
| R231 | 401 028 3200 | CARBON 1K JA 1/8W | | | 1 |
| | **TERMINAL P.C.B. ASSY** | | | | |
| PCB5 | 141-0-1939-11192 | Terminal P.C.B. Assy | | | 1 |
| | 4-2372-00830 | EC Terminal 1P | | | 5 |
| T1 | ⚠ 4-2519-74115 | Power Trans | | | 1 |

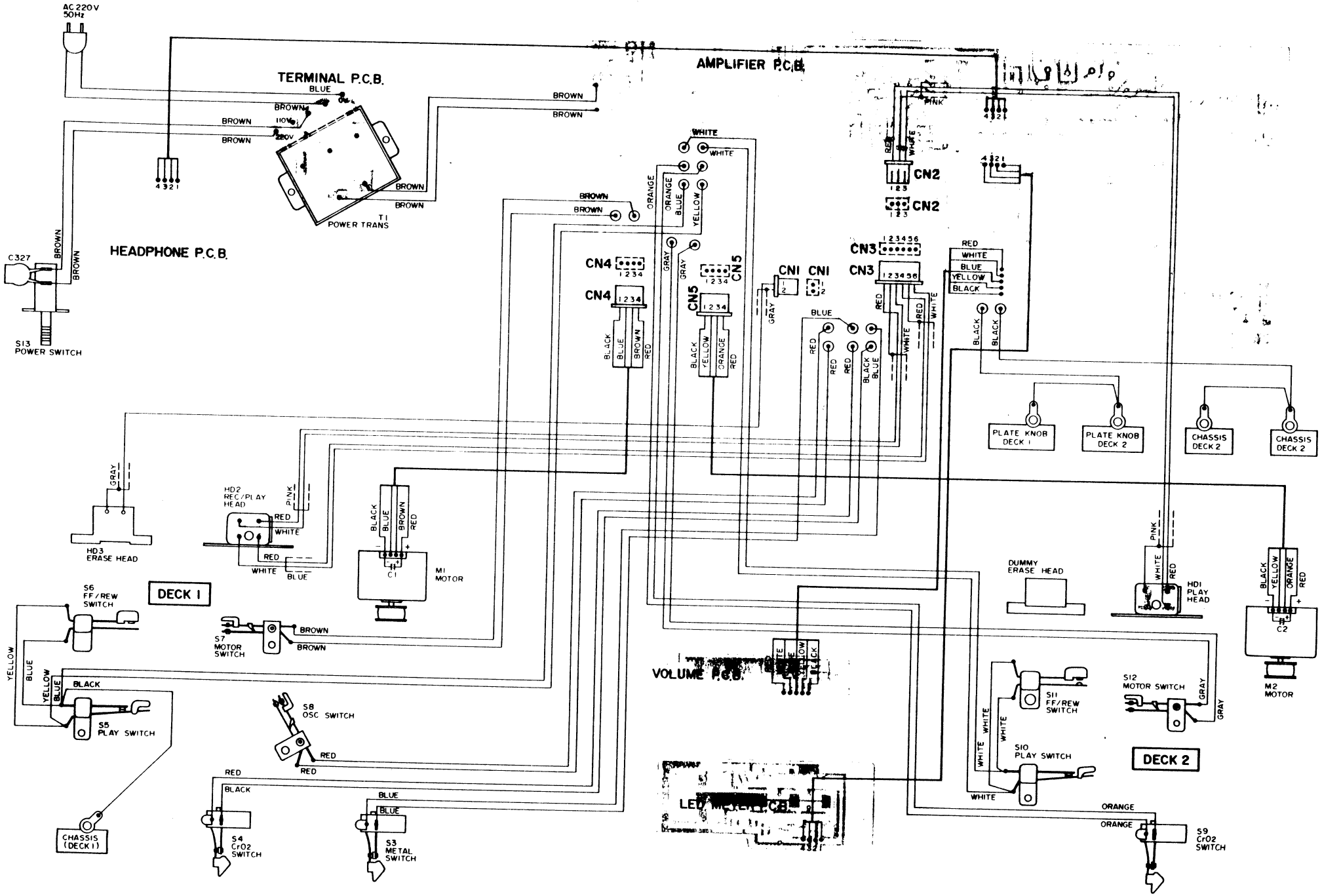
**NOTES:**

1. Parts order must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.

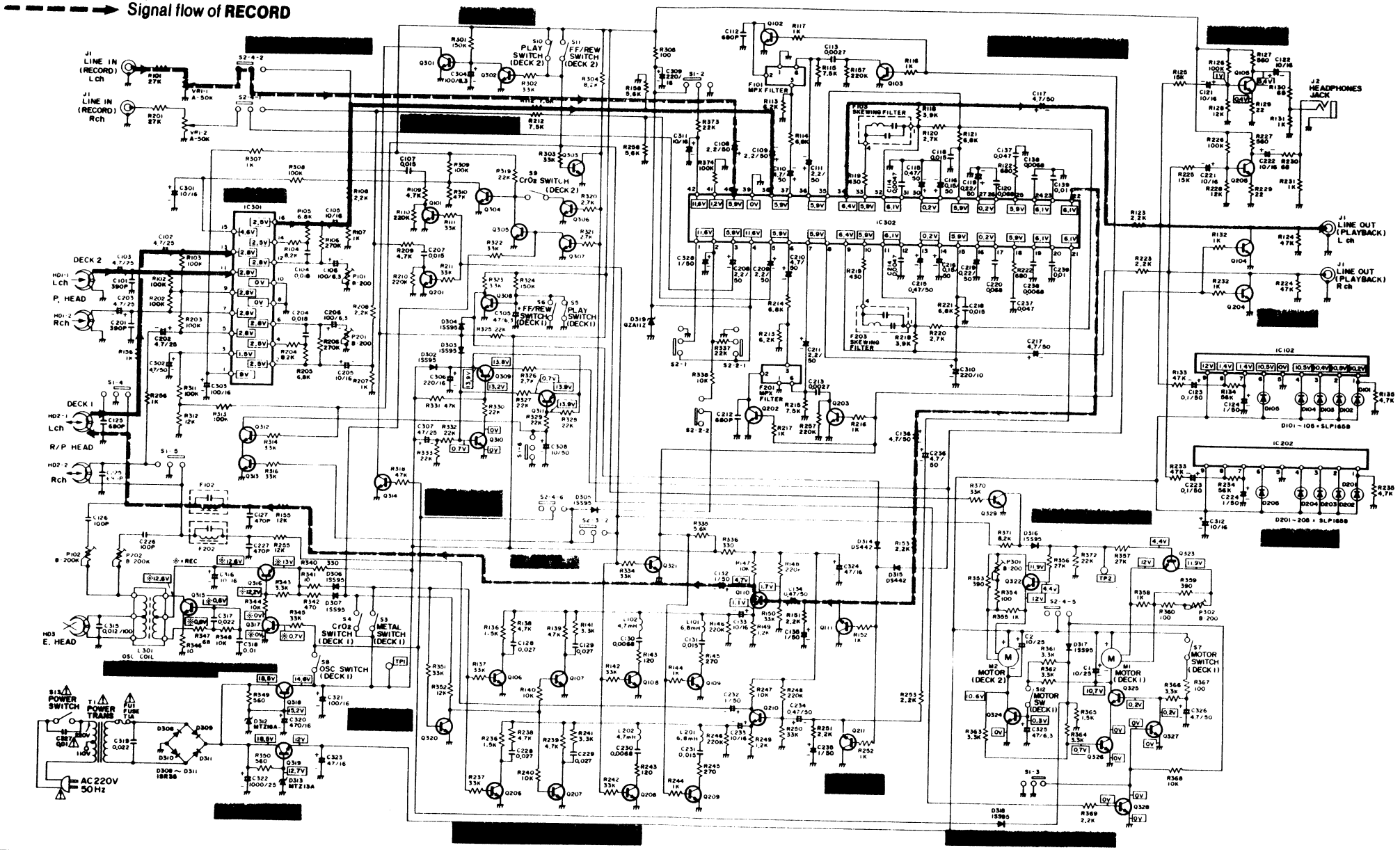
**PRODUCT SAFETY NOTICE**

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol ⚠ in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with ⚠, use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual. Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

# POINT TO POINT WIRING DIAGRAM



# SCHEMATIC DIAGRAM




| Name | Position | No. | Name | Position |
|---|---|---|---|---|
| Record / Play Switch | PLAY | S6 | F.F./Rew Switch (Deck 1) | OFF |
| DOLBY B / C Switch | B | S7 | Motor Switch (Deck 1) | OFF |
| DOLBY NR Switch | OFF | S8 | OSC Switch (Deck 1) | OFF |
| Speed Switch | NORMAL | S9 | CrO2 Switch (Deck 2) | ON |
| Synchro Start Switch | SEQ PLAY | S10 | Play Switch (Deck 2) | ON |
| Metal Switch (Deck 1) | ON | S11 | F.F./Rew Switch (Deck 2) | OFF |
| CrO2 Switch (Deck 1) | ON | S12 | Motor Switch (Deck 2) | OFF |
| Play Switch (Deck 1) | ON | S13 | Power Switch | OFF |



## PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol ⚠ in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with ⚠, use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual.
Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

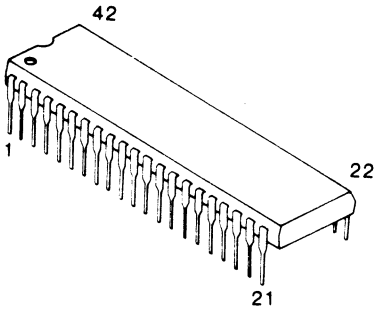
**NOTES:**

1. All resistors values are indicated in "ohm" (K = $10^3$, M = $10^6$)
2. All capacitors values are indicated in "μF" (P = $10^{-12}$)
3. All voltages indicated on the schematics are measured under the following conditions
   a. Use a V.T.V.M
   b. All voltages ± 10 % with respect to chassis ground
   c. No signals at input terminals
   d. AC input at 220 volts 50 Hz
4. This is a basic schematic diagram

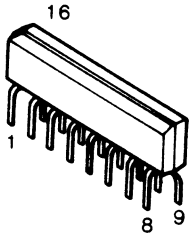
Because Fisher products are subject to continuous improvement, Fisher Corporation reserves the right to make any changes or modifications without notice.

# SEMICONDUCTOR LEAD IDENTIFICATION

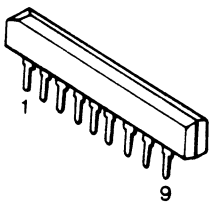
## INTEGRATED CIRCUITS




• CX-20187

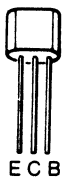



• TA 7405 P

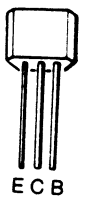



• TA 7366 P

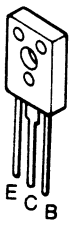
## BI-POLAR TRANSISTORS




- 2SA 608
- 2SC 536
- 2SC 1815
- 2SC 2274
- 2SC 3331




• 2SD 1012



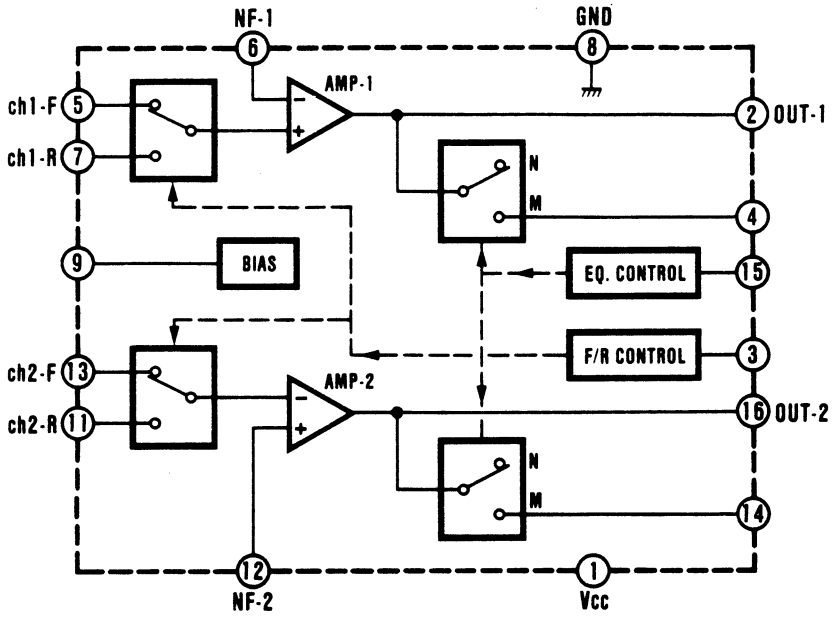

• 2SC 1846

## DIODES

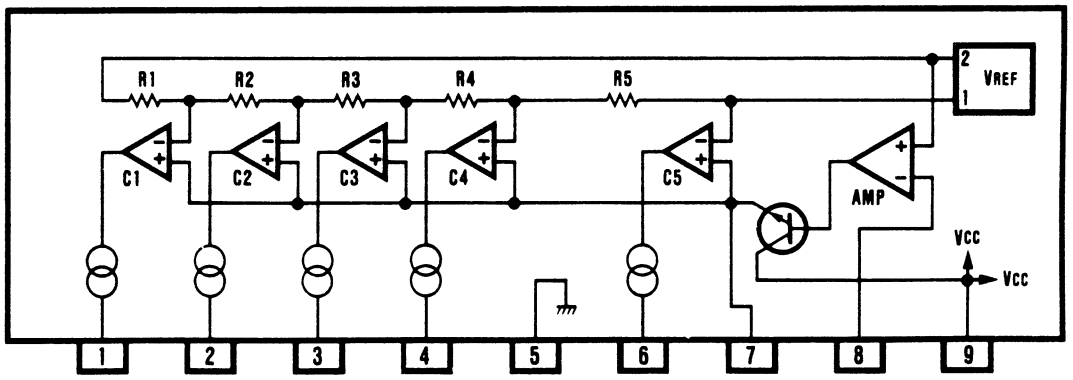
- 1SS 95
- DS135
- DS 442
- GZA 12 Z
- GZA 15 Z

# IC SIGNAL FLOW & EQUIVALENT CIRCUIT

## AF AMP IC TA 7405 P

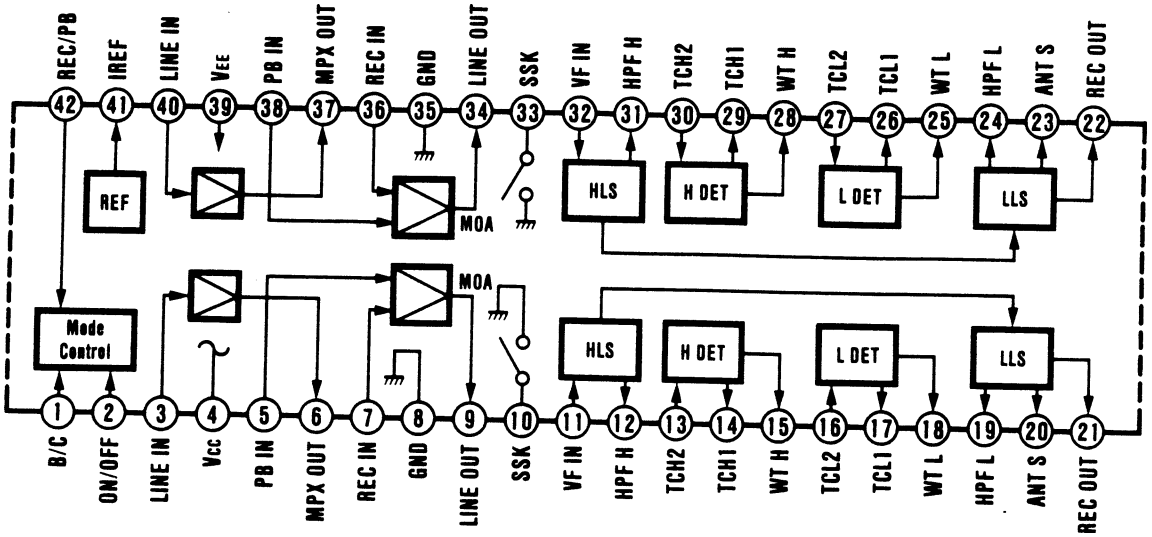



## METER IC TA 7366 P



# IC SIGNAL FLOW & EQUIVALENT CIRCUIT (Continued)

**DOLBY IC CX-20187**



# FISHER

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| | |
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| Funkstörmeßlabor | –127/128 |
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Unser FISHER-Team steht Ihnen jederzeit gerne zur Verfügung. Ersatzteilbestellungen wickeln Sie bitte ausschließlich mit unserer Service-Zentrale München ab.
Senden Sie uns im Garantiefall die ausgefüllte Garantiekarte ein. Bei unverkauften Lagergeräten des Fachhandels gilt als Garantienachweis eine eidesstattliche Versicherung mit eingetragener Modellbezeichnung und Geräte-Nummer oder ein Liefernachweis. Die gleiche Regelung besteht auch für Reparaturaufträge.
Bitte geben Sie unbedingt die Ersatzteil-Nummer und die Modellbezeichnung an.
Sie sparen so wertvolle Zeit. Vielen Dank.

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